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Contents

32

02 **From the CEO** Get Ready for our Roaring 20s
04 **Editor's Note** The Wonder of CES

Tech

08 **INNOVATOR** P&G Chief Brand Officer Marc Pritchard, Deloitte Global Chief Marketing Officer Diana O'Brien and WPP CEO Mark Read
14 **INTERNATIONAL FOCUS** Germany
16 **A TECHNOLOGY TO WATCH** Security and Privacy
18 **C4** Is 5G Hype or Becoming Reality?
20 **PIPELINE** CTA's Most Popular Standards

Features

24 **Experiential Retail** New experiences for consumers.
32 **The Car Cockpit of the Future** Displays and app integration are key components.
38 **Doubling Down on Esports** 2019 was the first billion-dollar year for esports.
44 **Tech This Out** The cross section of music and tech.
48 **CES Unveiled**
50 **Innovation Awards Showcase**

Policy

71 **POLICY UPDATE**
● Leading a National Dialogue on Diversity and Inclusion
● Important IP Information for Entrepreneurs: STOPfakes
● Extend the WTO E-Commerce Moratorium
76 **GUEST BLOG** Megatrend: Iris Biometrics
78 **POLICY IN ACTION** Innovation in Seoul, Korea
81 **FACES OF INNOVATION** Auriel Wright and Kristen Fang of StrattyX
82 **GREEN POLICY** The CES 2020 Eureka Park Climate Change Innovators
83 **POLICY NEWS** Meet Klaxoon
86 **TECH HUB** Eureka Park

Business

88 **C SPACE**
● C Space Elevates Content and Tech
● Streaming goes Multilingual
92 **FORWARD STRATEGIES** AI and Machine Learning Can Help Your Firm
93 **BY THE NUMBERS** The Ringing Future of Smart Home Technology
94 **RETAIL STRATEGIES** Top Retail Groups Ask 'What's Next' at CES
96 **ADVICE FOR ENTREPRENEURS** CES Tips
97 **TECH TACTICS** Next Gen TV
98 **CT REPORTS**
● CTA Foundation
● CTA Calendar
● Robbie Cabral Profile
102 **MARKET BEAT** Technology Product Lifecycles
104 **STATS & FACTS** Charting Technology Lifecycles

38

ON THE COVER
Diana O'Brien, Mark Read and Marc Pritchard
Illustrated by Gluekit

08

Get Ready for our Roaring 20s

With 2019 and Trump's tariffs and its two steps forward, one tweet backward approach behind us, we can say the past year was the denouement of a decade of growth, transition and change.

The 2010s may be defined as the era when controversy over immigration, globalism and free trade changed politics, politicians and the world. But it can also be defined by the change from 3G to 4G; from cell phones to smartphones and apps; from ownership to a sharing economy; and from a digital world to a connected world. Today, it's a new world of pervasive flat screens including tablets and phones, streaming, unbundling, and digital health care.

We have long preached that every company is a tech company.

CES reflects that truth. At CES 2010 we had 2,500 exhibitors, big CE company keynoters and just a few CMOs. CES 2020 will host some 4,500 exhibiting companies and includes presentations from Daimler Mercedes, Delta Air Lines, Impossible Meat, NBC Universal, Salesforce and Unilever. Our C Space programming will attract thousands of CMOs, big platforms and advertisers.

CES 2020 reflects the hope and growth opportunities of the 2020s. We are shifting to solving big problems with artificial intelligence and robotics. We will be healthier thanks to digital health and connectivity. 5G will create new opportunities. Startups are a critical part of the innovation ecosystem as the 1,200 companies in Eureka Park reflect. Climate change and demographics will force changes as we further urbanize, seek to save energy and lives, focus on resiliency, create smart cities and shift to self-driving vehicles.

> **"A century ago the roaring twenties were an era of levity, optimism and growth. I hope our 20s will be the era we solve some of the world's biggest challenges."**

As we move forward, the value of well-known brands will grow. Privacy will matter. New technologies will blossom. Governments will regulate out of fear or to protect the status quo and could erect new borders and taxes to restrict immigration, block trade and protect local businesses. China and the West may decouple as the economic battle shifts to whether the greater good and social harmony are more important than individual freedoms. Nations will choose whether human rights, free exercise of religion, choice in voting and access to information and the wealth of the internet are more important than social control.

The 2020s will be full of opportunities and challenges. New business models, socially conscious consumers and the promise of technology may clash with those seeking to preserve the past, old jobs and traditional concepts of privacy.

Through it all, our challenge will be to ensure the world receives the benefits of innovation. Think: healthier and safer lives. The empowering of the elderly and the disabled. Education that fits individual needs. And new forms of energy and transportation that save the environment, keep us mobile and provisioned, and improve our world.

A century ago the roaring twenties were an era of levity, optimism and growth. I hope our 20s will be the era we solve some of the world's biggest challenges.

Gary Shapiro,
President and CEO

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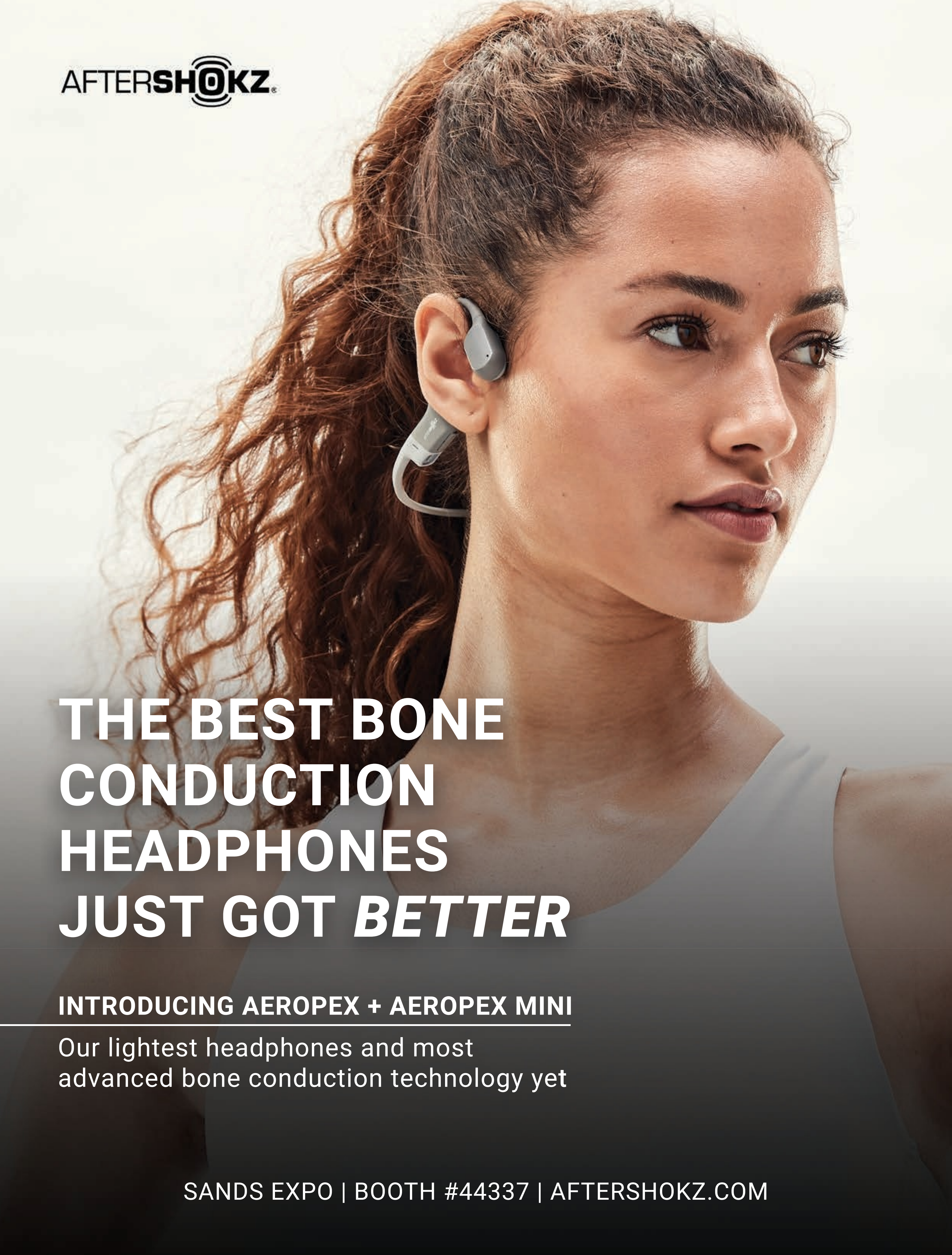
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Editor's Note

The Wonder of CES

Welcome to CES 2020! CES shows us the promise of the future with technologies that continue to improve lives in unexpected ways.

At CES, groundbreaking tech like self-driving vehicles, robotics, digital health and fitness devices, biometrics and drones that are transforming the world are spread across the show floor. But it is the entrepreneurs and inventors with a vision that make it happen. And there is no better place to gauge the temperature of the industry than Eureka Park, packed full of 1,200 startups with ideas they want to share with investors, partners and the media.

CES gives us an up-close look at the latest prototypes, devices, apps and services that could soon be on the market. And because CES is all about entrepreneurs with a great idea, we profile some creative startups with clever business plans.

We also take a forward look at some technology advances with stories on 5G, car interiors crammed full of the latest tech, Next Gen TV, biometrics and the smart home. We look at the billion-dollar esports market that is providing new opportunities for brands. In fact, this year at CES, sports technology is part of C Space — the home for pioneers in the marketing, entertainment and media industries — and will feature a conference track and an exhibit area at the ARIA. We also examine how technology is providing an immersive experience for customers at retail and host a distributor roundtable asking each what's next for the industry.

Our cover story profiles three CMOs leading top companies: Deloitte Global Chief Marketing Officer Diana O'Brien, P&G Chief Brand Officer Marc Pritchard and WPP CEO Mark Read who share their insights on how technology is being used as a valuable tool by advertisers — from augmented reality to mining sophisticated data.

On the policy side, we look at the International Trade Administration's Office of Standards and Intellectual Property that manages the interagency initiative known as STOPfakes. The group uses its resources to educate and assist businesses, consumers, government officials and the public about intellectual property. We also hear from a former Chairman of the U.S. International Trade Commission, Meredith Broadbent, who explains why the next six months will be an important time for the World Trade Organization. We also talked with Mayor Park Won-soon about Seoul, one of the first truly smart cities.

Enjoy CES over the next four days. Please send comments to: cstevens@CTA.tech.

Cindy Stevens

Cindy Loffler Stevens,
Editor-in-Chief

Visit CTA.tech/i3 for profiles on CTA's Innovation Entrepreneur Award winners, Aurora and Heal.

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It Is Innovation (i3) is published as a service to the members of the Consumer Technology Association (CTA) and to key players in the consumer technology industry. CTA represents more than 2,200 U.S. manufacturers of audio, video, digital imaging, accessories, mobile electronics, home networking, wireless communication, information technology and multimedia products that are sold through consumer channels.

The opinions expressed in articles are those of the authors and not necessarily those of CTA. Comments, questions and letters to the editor are welcome. Address responses to: *It Is Innovation (i3),* Consumer Technology Association, 1919 South Eads St., Arlington, VA 22202, tel: 703 907 7600.

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It Is Innovation (i3) (USPS 022897 Vol. 8, No. 1) is published bi-monthly by the Consumer Technology Association, 1919 South Eads St., Arlington, VA 22202. Periodicals Postage Paid at Arlington, VA and at additional mailing offices. POSTMASTER:Send address changes to *It Is Innovation*, CTA, 1919 South Eads St., Arlington, VA 22202. Canadian Publications Agreement No. 41502062.
U.S. & Canada—$24.99 a year; $5 for a single issue
Mexico—$39.99 a year; $7.50 for a single issue
Elsewhere—$49.99 a year; $9.00 for a single issue
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Tech

16

A Tech To Watch

New Emphasis on Privacy and Data Security

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A LOOK AT NEXT-GEN TECH

Disruptive innovation is central to America's entrepreneurial culture.

8 Innovator 14 International Focus 16 A Tech to Watch 18 C4 Trends 20 Pipeline

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SEE IMPOSSIBLE

By Cindy Loffler Stevens

INNOVATOR

Connecting Brand Executives at C Space

C Space at CES is where the all-stars from marketing, entertainment and media come together. Top CMOs, content creators, major studios and advertising firms gather for an immersive experience with many Fortune 100 companies represented. Located at ARIA on four floors, C Space attracts more than 33,000 professionals that want to experience how new technologies are changing the way consumers behave and consume content. Top executives Procter & Gamble's Marc Pritchard, Deloitte's Diana O'Brien and WPP's Mark Read spoke with *i3* about some of the tech issues that impact their businesses, including the important role of data, and how compelling and authentic storytelling better connects brands with consumers.

Chief Brand Officer at Procter & Gamble **Marc Pritchard**

Marc Pritchard, a three-decade veteran of P&G, sets the company's multibillion-dollar media, marketing and advertising strategies, leading marketing innovations for P&G's portfolio of trusted, quality brands. He joined the company in 1982 as a cost analyst and moved into marketing in 1987. He has 20 years of experience in the beauty and personal care categories, becoming president of Global Cosmetics and Personal Care in 2003. Pritchard served as president of Global Strategy and was named P&G's chief marketing officer in 2008. He believes in the power of brands to provide people with superior products while also being a force for good in the community.

Q What is P&G doing to become a force for good and a force for growth?

A We're reinventing brand citizenship by moving from brands that are "all about themselves" to brands that are a "force for good and a force for growth." Consumers want to know what brands believe in, their values and views, and they buy based on shared beliefs. We're using our voice in advertising to promote equality. Equality is limited by bias, and the portrayals of people in advertising embed memories into our brains that form bias — so we strive to accurately portray all people — across gender, race and ethnicity, sexual and gender identity, ability, religion and age. We also periodically take a stand on brand-relevant issues. For example, Always changed the meaning of the phrase "Like A Girl" and is now ending period poverty by donating pads to young women who miss school because they can't afford adequate period protection. We're using our brands to promote sustainability through innovations like Tide and Ariel cold water cleaning, and hair care products made to use without water — designed to promote responsible consumption just by using them.

But we know we can't do it alone, so we've joined industry-wide initiatives for collective action. We're part of the #SeeHer movement promoting the accurate portrayal of women and girls in advertising and media and #SeeALL promoting the accurate and relevant portrayal of race, ethnicity and all cultures. We've committed to equality in the creative supply chain as founding sponsors of Free the Work, to get women and underrepresented voices in the director chair. We've joined #BrandsforGood to promote sustainable behavior. And we're part of the Global Alliance for Responsible Media to eliminate toxic content online. Brands are ubiquitous as they touch people every day, often multiple times a day. Imagine the impact if all brands stepped up to be a force for good and a force for growth.

Q Can you talk about the roadmap that Brand 2030 provides?

A Brand 2030 is part of P&G's Ambition 2030 which aims to make the world a better place through sustainability. Our goal for brands is to have 100% of our leadership brands enable and inspire responsible consumption by 2030. To achieve that goal, each brand establishes a "Brand Ambition" that puts a relevant social or environmental commitment at the heart of the brand's consumer experience to help solve

Q How are you reinventing the agency model to encourage stronger brand stewardship?

A We're reinventing the agency model to create new models for greater creativity and speed at lower cost. We've implemented a "fixed and flow" model, investing a "fixed amount" for work that requires experienced creative people, like campaigns, supplemented with a "flow to the work" approach through open-sourcing for fast-cycle creative at the speed of popular culture. For example, SK-II has a fixed contract with Publicis for their Change Destiny campaign, along with other agencies who've created brilliant work like #BareSkinChat and #Masterclasses with James Corden, John Legend, Japanese comic Naomi Watanabe and Chinese actress Tang Wei.

Agencies are also stepping up with new models, such as Grey Midwest that co-located with Febreze and other brands creating a "borderless" approach and collapsing creativity from months to hours. We've co-located with "Publicis Agile Lion" to create fast-cycle work on Crest and Oral B. And we've created an entirely new model that brings multiple agencies into one integrated group called "Woven" that's creating award-winning work like the "It's A Tide Ad" campaign. Reinventing agency partnerships is saving money and raising the bar on creativity.

a sustainability challenge. That inspires action in product and packaging innovation, brand communication, transparency and safety, and reducing supply chain impact to achieve the ambition. Our intent is for leadership brands to create innovative products, solutions and services that make it easy for consumers to responsibly consume products. When they do that, they create value for consumers and society and are truly a force for good and a force for growth.

Q How is P&G addressing the diversity and inclusion issue?

A P&G believes in diversity and inclusion. With over 140 nationalities represented in our workforce, our own diversity helps us reflect and serve consumers around the world with our brands. And while diversity is essential, we believe inclusion changes the game. Every day we strive to get the full value of our diversity through inclusion through an environment where P&G people can be their best, full and authentic selves. But our job doesn't end there — our belief and commitment extend beyond P&G's walls. We use our voice in advertising as a force for good to eliminate bias and drive equality and inclusion.

A few examples: SK-II's Change Destiny campaign rejects the notion that women have an "expiry date" that defines when they're expected to live up to societal expectation, like when to be married. Olay's Face Anything campaign shatters norms, rejects conformity, and redefines role models of women living life on their own terms. Secret's All Strength No Sweat fights for equality, including action to help the U.S. Women's National Soccer team achieve equal pay. And P&G promotes conversations about racial bias with "The Talk," highlighting the talk black parents have with their children to help them deal with prejudice. We not only believe in diversity and inclusion; we've built it into how we do business every day.

Q How does P&G continue to encourage innovation for its clients?

A We are innovating how we innovate, moving from a sequential, phased approach to a "lean" innovation approach used by startups. As a company leadership team, we went to Silicon Valley and learned from the best, including Eric Ries and several successful startups. Lean innovation built on our strengths, like keeping the consumer at the center of everything we do. We focus on identifying the consumer "problem to be solved" and learned a more agile way of working, including fast-cycle learning with minimum viable prototypes where we conduct behavior-based experiments leveraging digital technology. With this new way of working, we now have over 180 experiments.

Q How is P&G using tech to better help brands get their messages out?

A We're reinventing media from "mass blasting" to mass reach with one-to-one precision using data and technology. We have our own databases that enable us to reach people when and where it matters through automated, algorithm-driven ad placement without annoying and wasteful ad frequency. We're also integrating cutting-edge digital technology into our products to create irresistible consumer experiences which could eventually replace ads. For example, SK-II has created an immersive augmented reality experience called Future X. It's an AI-supported shopping experience, with personalized recommendations based on smart scans of your skin, browsing on virtual shelves and shopping through a wave of the hand. And when you take SK-II's Pitera Essence home, it has smart packaging with IoT technology along with a companion app for personalized skincare tips every day. With immersive experiences like this we can imagine a world where technology creates entirely new ways to engage consumers.

Q What do you look for at CES?

A We are always looking for ideas, inspiration and partners to help us innovate how we innovate. We are always raising the bar to give consumers the highest quality and absolute best benefits they expect and deserve in their product package, communication and shopping experiences with the brand. We see CES as the Consumer "Experience" Show, so we come here to discover new-to-the-world ways to create irresistibly superior consumer experiences. ■

Global Chief Marketing Officer at Deloitte

Diana O'Brien

Q **What is Deloitte's business model? How is it disrupting the industry?**

A As one of the world's largest professional services firms, our business model is to help our clients solve their biggest challenges. In a time of unprecedented technological innovation and change, how brands, leaders and consumers respond drives disruption. We have the depth across industries and sectors to understand the implications of these responses and we use that knowledge and foresight to advise our clients on how to adapt and move forward and thrive in the face of disruption.

Diana O'Brien is the Global Chief Marketing Officer for Deloitte, responsible for driving growth across all businesses. O'Brien connects a network of brand, communications, marketing and organizations. Her responsibility is to champion the voice of the customer, surface deep insights with advanced analytics, increase sales velocity, and gain greater competitive advantage with stronger, differentiated experiences. One of *Forbes'* World's Most Influential CMOs, O'Brien also leads the C-Suite CMO Program and serves as an advisory partner to global life sciences clients. O'Brien serves on numerous boards including the Ad Council and Impact Autism Foundation.

Q **What is the role of storytelling in marketing today? Do personal stories resonate more with consumers?**

A Human beings have always told stories to communicate, and the most effective marketing tells great stories. Today, consumers expect brands to create experiences and products that not only meet their needs, but also anticipate their wants.

A more recent expectation is that brands also strive to solve bigger problems in the world, society and the communities where they live and work. If they engage in these higher-level challenges, brands must do it with authenticity. We've all seen public missteps where brands use a one-off tweet to try to associate themselves with a movement or an event. Successful brands authentically connect any social impact with their purpose.

Q **How are you using tech tools and various media platforms to reach new audiences?**

A Like all brands today, we use a wide range of tools and platforms to tell stories, share insights and connect with our clients, both digitally and at live events. Podcasts have been a more recent success for us — whether our own or others we participate in or sponsor.

Podcasting isn't a new medium, but it's very effective at reaching customers where they are, in the time they have. More than half of the people in the U.S. have listened to a podcast, and something like one in three say they listen at least once a month. Deloitte has over a dozen podcasts in unique topic areas, and they give global reach to our thought leadership.

Digital Reality [augmented reality, virtual reality, mixed reality (MR) and 360-degree video] has become another channel we use both to engage audiences at live events and share our content. There is no better way to capture someone's attention in a noisy and crowded event space than to immerse them in your world in a different reality.

Q **How is Deloitte addressing diversity and inclusion?**

A Deloitte has been helping shape what inclusion looks like since 1993. We were the first professional services organization to establish women's and diversity initiatives. A lot has changed since then, and our leaders remain committed to evolve and innovate in this space and keep the core tenet of empowering our people and fostering an inclusive culture. That's why we're on best-places-to-work lists, like *Working Mother's* 100 Best Companies, Best Companies for Working Mothers and *FORTUNE's* 100 Best Companies to Work For.

Q **What do you look for at CES?**

A To be inspired and to connect for impact. CES provides so many opportunities to learn about new technologies and how consumers' use of tech disrupts different industries and business models. It is easy to be inspired by the many companies that anticipate and even define technology shifts and move their businesses into the future. And nothing is more important and satisfying for me than to connect with clients and have compelling conversations about what we are seeing and what it means. That is how you connect for impact in our world today. ■

CEO of WPP
Mark Read

Since 2018, Mark Read has been CEO of WPP but previously served as executive director of WPP plc and head of strategy and CEO of WPP Digital, where he helped the company move into technology by acquiring 24/7 Real Media, the founding of data-driven creative network POSSIBLE and the launch of Stream, WPP's "unconference." In 2015, he was appointed Global CEO of Wunderman, which became Wunderman Thompson in 2018, one of WPP's largest businesses, with more than 20,000 people across 90 markets. Its clients include Microsoft, Dell, Shell, HSBC, BT and Adidas. In 2018 he was named joint chief operating officer of WPP, with responsibility for clients, operating companies and people.

Q How are you reinventing the agency model to encourage stronger brands?

A Over the past year, we've been busy reinventing our model. We have been integrating our companies to take out the artificial distinction between creative and digital — hence VMLY&R and Wunderman Thompson — and these two new companies are resonating well with clients, winning new business and attracting great talent to work. We're investing in technology across the company, so that we don't reinvent it multiple times, but have one platform that helps all our agencies and clients connect.

Q How has tech changed advertising and PR? How are you using data to refine messaging?

A Tech has changed every aspect of our business, not just traditional advertising and PR. The strength of our offerings began in 2007 with the acquisition of 24/7 Real Media, giving us the "industrial scale" ad tech capabilities from which we have developed Xaxis. Since then, we have made further acquisitions and invested in internal development efforts — particularly more recently in AI and automation. These capabilities allow us to deliver audiences more effectively and efficiently to clients, and deliver their messages to their consumers in a more creative, timely and useful fashion.

Q How does WPP help its clients' messages get heard in such a cluttered marketplace and with so many channels?

A Creativity is at the heart of what we offer clients and it's never been more important than in today's environment. With thousands of commercial messages shouting for attention, it's the truly creative ideas that break through and have an impact.

Q How is WPP addressing the diversity and inclusion issue?

A WPP's new culture is one founded on the values of open, optimistic and extraordinary. It's important for us that our people are diverse and that our culture is inclusive, and we don't believe that you can have one without the "us." It's important, not just because it is the right thing to do, but because it's what we need if the work that we do for our clients is going to represent society and resonate with consumers. We have three key priorities:

First, we are resetting expectations of what it means to lead and what an inclusive leader looks like. Leaders create opportunities for diverse teams that are not only expected to excel but feel they belong as their authentic selves. Second, we are building an open community based on a campus model that allows us to expose employees to broader opportunities to communicate, collaborate, support and connect. Our best work comes when every person is an active contributor to our rich culture, bringing their unique perspectives and voices. And third, we are working to address the structural barriers that prevent a diverse workforce at all levels, looking at areas such as flexible working and parental leave to make sure that they support our ambition of being a fully inclusive workforce.

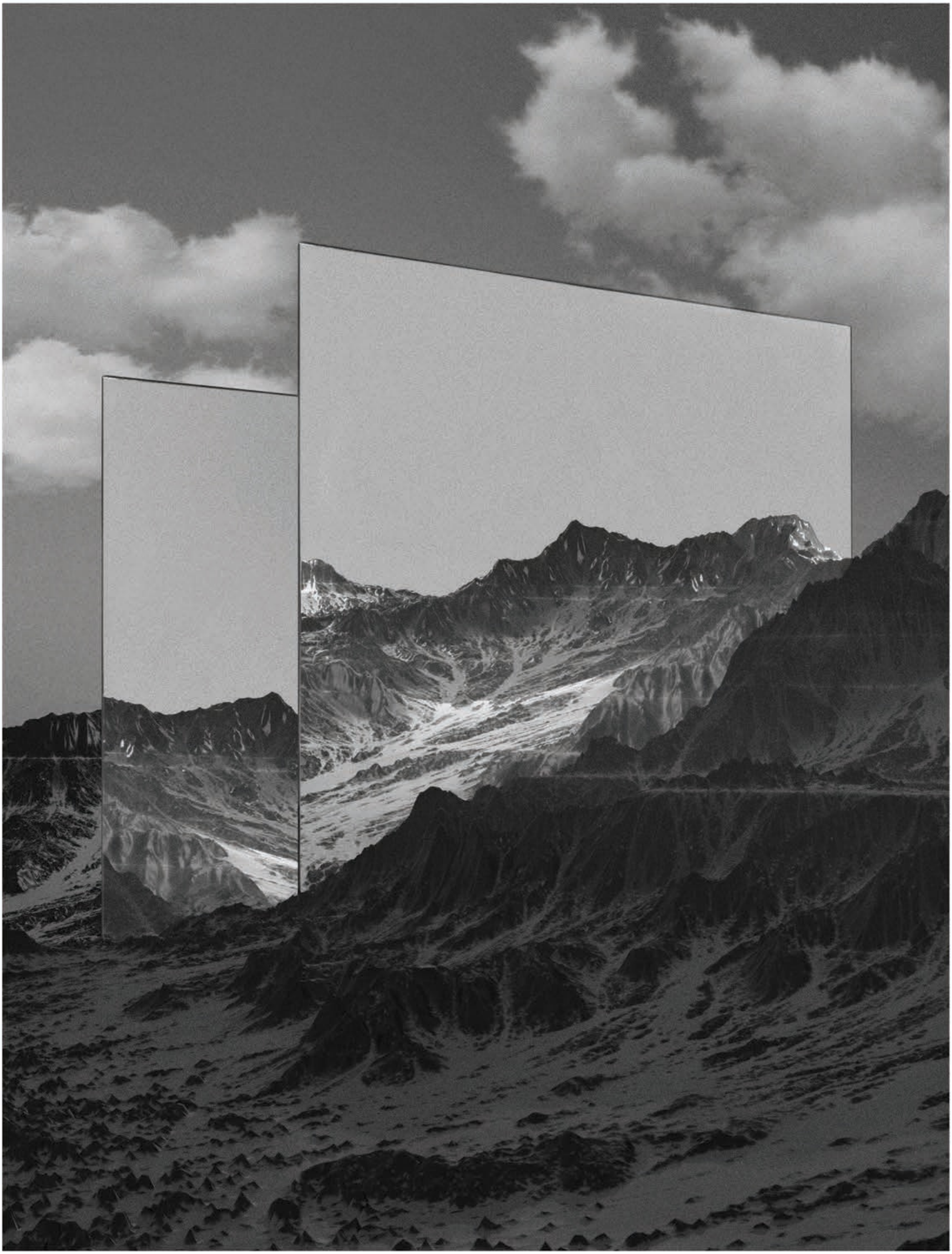
Q How does WPP continue to find the creative spark for its clients?

A WPP's most important competitive advantage is creativity. It is what makes WPP special and what differentiates us from consultants and other professional services firms. The message we hear from clients is very consistent: they want the best creative ideas. These ideas aren't just expressed in 30 second TV ads anymore but in the wide variety of channels and media available. The spark to come up with the best ideas comes from within our people and from collaboration. It's not just that our people need to be extraordinary, it's also that when they come together to create ideas, extraordinary work will result.

Q What do you look for at CES?

A The new technology products and services that I need to know about to shape how WPP invests, the plans we need to put together for our clients, and the partners who we need to get to know. ■

CES 2020 Diana O'Brien, Marc Pritchard and Mark Read will be speaking at C Space at the ARIA with other top industry executives.



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By Mark Chisholm

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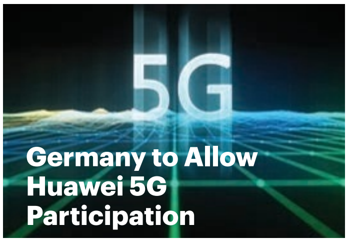

Germany to Allow Huawei 5G Participation

Germany announced that it would not exclude Huawei from its fifth generation (5G) network, as the European Union readied its promised autumn decision on if it would include Huawei in its 5G buildout. German regulators stated that they wished to create "a level playing field" for vendors. Currently, telecom operators in Germany use Huawei equipment and many feared that excluding Huawei would delay 5G deployment and increase costs.

Innovation Hub Launches in Dusseldorf

IT company Infosys in November opened a new Digital Innovation Centre in Dusseldorf aimed at resolving the educational STEM skills gap. The innovation hub, focusing on cloud-based services, the Internet of Things, 5G and artificial intelligence, will link educational institutions with European businesses. "The new centre, along with our strategic academic partnerships, will help us build the next-generation of technology talent," said Pravin Rao, chief operating officer at InfoSys.

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Emden
Bremen
Oldenburg
Hannover
Osnabrück
Braunschweig
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Bochum
Göttingen
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Siegen
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Erfurt
Jena
Gera
Chemnitz
Zwickau
Aachen
Bonn
Frankfurt am Main
Wiesbaden
Mainz
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PRAGUE
Bamberg
CZECH REPUBLIC
Würzburg
Mannheim
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MUNICH STARTUP LOOKS TO DEVELOP AIR TAXI

Lilium, a Munich, Germany-based startup, plans to produce one of the world's first flying taxis. The company, which has raised more than $100 million from investors, has developed a prototype air taxi featuring four engines built inside wings capable of rotating and enabling the vehicle to take off and land like a helicopter.

CES 2020 46 companies from Germany will be exhibiting at CES.

India, Germany to Increase Industrial Cooperation

Germany and India have pledged to increase cooperation in areas such as cybersecurity, climate change, energy security and artificial intelligence. German Chancellor Angela Merkel and Indian Prime Minister Narendra Modi signed several cooperation agreements during Merkel's visit to India. In particular, the two countries' cooperation will focus on resilience and environmental innovation. Speaking on a recent air pollution emergency declared in the Indian capital of New Delhi, Merkel stressed that "This shows how important our cooperation in the field of environmental protection is, especially, to also have better environmental standards."

Germany Looks to Boost Electric Vehicle Subsidies, Infrastructure

In an effort to boost sales of low-emission vehicles, Germany intends to increase government subsidies towards the purchase of such vehicles by 50% over the next five years, according to Reuters. During a speech at Volkswagen's Zwickau factory celebrating the mass production of the car makers' ID.3 electric car, German Chancellor Angela Merkel announced the government would invest 3.5 billion euros ($3.85 billion) in building charging stations for electric cars.

Clockwise from top left: zf L/Getty Images, Peter Hermes Furian/Alamy, Courtesy of Lilium, DPA Picture Alliance/Alamy (2).

Doers Doing More

World's Most Portable/Universal Stand
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Works on most tablets
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i Tech • By Murray Slovick

A TECH TO WATCH

New Emphasis on Privacy and Data Security

The data protection world was busy in 2019. In July, the Federal Trade Commission (FTC) fined Facebook $5 billion for inappropriately sharing information belonging to 87 million users with the now-defunct British political consulting firm Cambridge Analytica. In September, the FTC fined YouTube $170 million in the largest penalty ever levied for violations of the Children's Online Privacy Protection Act (COPPA), which imposes restrictions on the use of personal data associated with children ages 12 and under. According to the law, digital platforms that collect data from young users are required to have their parents' consent and parents must be given the option to opt out of having their children's information shared with third parties.

Data security is now even more important with the advent of the Internet of Things (IoT). As connected devices exchange data with servers across networks (e.g., local area networks, cellular networks and internet service providers), entry points could be exploited by enabling unauthorized access and misuse of personal information.

Responding to Criticism

These companies, however, have taken steps to improve their privacy issues. Apple and Google now require people to opt in to take part in the accuracy program. Amazon adjusted its privacy settings for Alexa after backlash. And Google's Nest devices now come with physical switches to turn off cameras and mics.

Nonetheless, privacy problems continue. Researchers from Security Research Labs (SRLabs) recently created apps hiding malicious code that could leave Google and Amazon smart speakers exposed to hackers. SRLabs researchers were able to compromise the data privacy of users by requesting and collecting personal data, as well as eavesdropping on users.

SRLabs developed an app giving a fake error message which sounded as if it had closed, while it actually continued operating, even transcribing everything the user said. Fortunately, this was not exploited and SRLabs shared its findings with both Amazon and Google before making them public.

Tech giants Apple, Facebook, Google and Microsoft have called for a federal data privacy law. In a letter to congressional leaders, Business Roundtable CEOs urged policymakers to pass a comprehensive national data privacy law that strengthens protections for Americans. Over 50 chief executives including Amazon's Jeff Bezos; Best Buy's Corie Barry; Cisco Systems' Chuck Robbins; and IBM's Ginni Rometty signed an open letter to lawmakers asking for a federal privacy bill, arguing that consumers may not understand rules "that may change depending upon the state in which they reside."

And in a letter sent to Congressman Ben Ray Lujan, CTA suggested a federal approach that increases privacy protections and allows the U.S. to remain the world leader in innovation.

In October, Senator Ron Wyden (D-OR), proposed legislation ("Mind Your Business Act") to bring serious punishments for companies that violate people's data privacy, including larger fines and potential jail time for CEOs. The bill is based on three basic ideas: consumers must be able to control their own private information; companies must provide more transparency about how they use and share data; and corporate executives should be held personally responsible for protecting personal information. The bill imposes tough criminal and civil penalties for knowingly or willfully certifying a false statement in an annual data protection report.

Privacy will be front and center in 2020, too. The California Consumer Privacy Act (CCPA), was signed into law on June 28, 2018, and took effect on January 1. The law provides new privacy benefits to California's 40 million residents, granting consumers a right to know what information companies have on them, a right to have that information deleted and the right to opt-out of the sale of that information. ■

Jing Jing Tsong/Theispot.com

MOVE IT.
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MAKE IT.
DOT IT.

PRECISION MOTION TRACKING

Xsens DOT is a state-of-the-art development platform for the analysis and reporting of human kinematics. Featuring up to 5 high-accuracy wearable inertial sensors and easy-to-integrate mobile API/SDK.

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SANDS EXPO, **STAND 45552**

xsens DOT
PRECISION MOTION TRACKING

By Susan Schreiner

C4 TRENDS

5G: Are we There Yet?

A host of 5G smartphones are launching at CES this year from LG Electronics, Samsung and many others.

Enthusiasm around 5G focuses on commercial launches by the four largest U.S. mobile operators. By the end of 2022, 24% of connections in North America will be on 5G networks, rising to 46% by 2025 — equivalent to 200 million 5G connections — according to a new GSMA study on North America's global 5G leadership.

5G enables intelligent connectivity that will enhance all industries. Imagine a digitalized society where 5G radically re-engineers how we perform nearly any task thanks to its capacity to instantaneously meet the needs of any application.

While progress is being made in data throughputs, video streaming latency, data reliability and voice-call setup and drops, backend work still needs to be done on the infrastructure side.

The Evolving Road To 5G

"Verizon is well on its way to 5G," says Sanyogita Shamsunder, VP of the 5G Labs and Innovation at Verizon. Connectivity and the use of the cloud and computing at the edge in a rapid, real-time manner will create new opportunities.

Verizon Business CEO Tami Erwin says the company's recent restructure is sending a strong signal of its ambition to be a leader in 5G. "It is clear to us and a growing number of customers that 5G will fundamentally change businesses' transformational journey," she says. "This technology will give companies new tools to serve their customers and enable companies to gain efficiencies in their own operations."

Among early 5G applications is retail, with 5G offering enhanced shopping experiences that impact operations and logistics, including 3D cataloging of inventory and manufacturing for intelligent asset management. AR and VR glasses are not only for entertainment, but for training, education, operations and remote collaboration. Similarly, public safety for emergency responders is another early use-case. "Verizon is testing an infrared mask that can see through smoke," Shamsunder says.

Gaming in 5G also offers the potential for "exponential growth." Lynn McMahon, Accenture's Media and Entertainment says, "the business model is already in place and consumers are used to, and willing to, subscribe and pay for content." She adds, "What starts as a pretty cool concept in peer-to-peer playing platforms ends up being taken into the health care industry or automotive and manufacturing."

Verizon recently launched the "Built on 5G Challenge" with 10 finalists vying to increase business efficiency, improve immersive experiences and solve their customers' challenging problems to win cash prizes. One of the 5G ideas presented was Loro, a companion app that uses hands-free and eye-tracking technology to help those with accessibility challenges take advantage of smart home devices. There is also Mobcrush, who is working on a B2C live streaming platform for gaming creators and Garou, a VR experience aimed at building communities where users can share VR content and interact with others for real estate purposes or recreational exploration.

> **"This technology will give companies new tools to serve their customers and enable companies to gain efficiencies in their own operations."**
>
> -Tami Erwin, Verizon Business CEO

Hype or Reality?

It seems to be both — although there are signs that 2020 could be a tipping-point. Challenges remain as regulators consider how to level the playing field. On a global basis, there needs to be more spectrum for operators at a reasonable cost. However, the transformative potential of 5G is unrivaled as new ways to monetize assets unfold and new use-models are created to solve real challenges. ■

CES 2020 Qualcomm President Cristiano Amon will participate in a **5G SuperSession** on Jan. 8.

Marko Aliaksandr/Shutterstock

Max and Isabella have arrived home from school.
3:30 PM

Meet the Hoop, a **clever little helper** designed with your needs in mind. We took the standard home security camera and elevated it to a new level, with an easy-to-use mobile app that helps keep you and your family in the loop and on track. With state-of-the-art features like advanced AI detection, motorized motion panning and tracking, real-time communication, relevant notifications, and face-based or time-based reminders, Hoop empowers you to manage your home, anytime, anywhere.

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CES

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By Dave Wilson

PIPE LINE

CTA's Most Popular Standards

CTA's standards committees were busy in 2019 with nearly 1,800 active participants and over 600 meetings. The top ten most downloaded CTA standards show how these projects impact the industry.

1 ANSI/CTA-861-G
A DTV Profile for Uncompressed High-Speed Digital Interfaces

CTA's most downloaded standard describes how set-top boxes and TV sets (and other devices sharing digital video signals) can communicate their capabilities to one another and communicate the characteristics of the video they're sharing.

2 ANSI/CTA-2034-A
Standard Method of Measurement of In-Home Loudspeakers

This standard describes how to measure and report the directivity of a loudspeaker, whether it stands by itself or is mounted on a wall or ceiling. It also describes how to use this directivity data to estimate the in-room frequency response that research has shown correlates well to subjective listening preferences of consumers.

3 ANSI/CTA-NSF-2052.1
Definitions and Characteristics for Wearable Sleep Monitors

The joint CTA/National Sleep Foundation document defines characteristics of sleep and the functionality needed in consumer sleep measuring devices to measure those characteristics. For example, it defines "asleep" and describes how indicators of being asleep may include reduced mobility, closed eyes, eye twitches and lowered heart rate.

CTA sleep tracker standards are for humans only

4 ANSI/CTA-2056
Physical Activity Monitoring for Fitness Wearables: Step Counting

The standard measures the accuracy of consumer step counters and describes a test setup where people are recorded walking or running on a treadmill while wearing a step counter.

5 ANSI/CTA-2065
Physical Activity Monitoring for Heart Rate

This health, fitness and wellness standard addresses heart rate measurements among a diverse group of people. Each wears the device to be tested along with another heart rate measuring device known to be accurate. Heart rate is measured under various standardized conditions.

6 CTA-2069
Definitions and Characteristics of Augmented and Virtual Reality Technologies

CTA's first augmented reality/virtual reality standard defines terms like "360° spatial audio," "spherical video," "room-scale VR" and more.

7 ANSI/CTA-708-E
Digital Television (DTV) Closed Captioning

The digital TV closed captioning standard describes how to incorporate closed captioning into the digital TV signals used by local over-the-air broadcast stations in the U.S. and other countries.

8 CTA-426-B
Loudspeaker, Optimum Amplifier Power

CTA standards help you count steps accurately

This standard is not necessarily the maximum amplifier power the loudspeaker can handle without getting damaged. It addresses the pairing of amplifiers and loudspeakers for optimum performance and describes how to determine the most power that can be delivered to a loudspeaker while still permitting the loudspeaker to operate within acceptable limits.

9 ANSI/CTA-2010-B
Standard Method of Measurement for Subwoofers

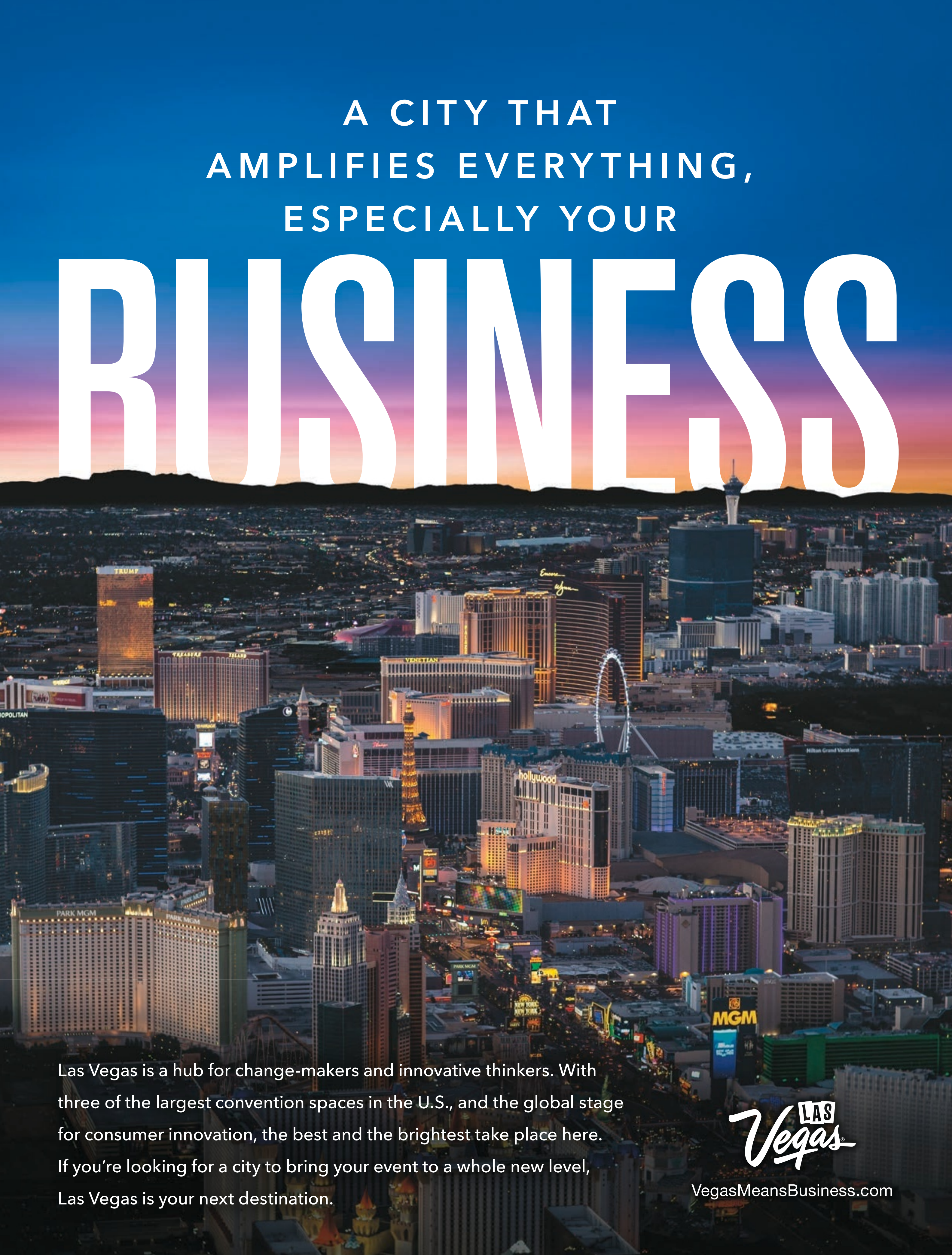
This standard measures the performance of powered and passive subwoofers and describes how to determine the sound pressure level from a subwoofer, and how to determine if the subwoofer is suitable for quiet, moderate, loud or very loud listening environments.

10 ANSI/CTA/NSF-2052.3
Performance Criteria and Testing Protocols for Features in Sleep Tracking Consumer Technology Devices and Applications

The joint CTA/National Sleep Foundation standard for measuring the performance of sleep tracking devices describes how to confirm the accuracy of a particular device's performance when it comes to measuring specific elements or characteristics of the sleep process. ■

GO ONLINE: CTA also launched new committees addressing artificial intelligence and cybersecurity. All are welcome to participate in CTA standards activities. Visit standards.CTA.tech

Top to Bottom: The Lazy Artist Gallery/Pexels, Adrianna Calvo/Pexels.



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A History Of Nurturing Meets The Digital Age

Lisa D. Earnhardt, Executive Vice President, Medical Devices, Abbott

For 130 years, global healthcare company Abbott has been focused on advancing science to provide more effective therapies to patients and the physicians providing their care. The tradition continues.

By Robin Raskin
Journalist & Tech Expert

We caught up with Abbott's Executive Vice President of its Medical Devices business, Lisa Earnhardt, to talk about the next disruptors in health technology.

Q&A

What technologies do you think are impacting healthcare the most?

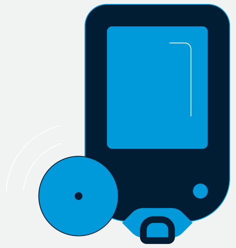
The role of technology has never been more important in healthcare. And it's happening quickly. Driving this transformation in part is the advent of sensor technology that is making devices more personal and wearable. Add to that, connectivity – enabled by smart phones and widespread Internet access – which is giving more and more people access to health information and remote monitoring at their fingertips. Devices and applications that aid in prevention, early stage detection and/or management of health issues are becoming prolific.

Just look at the success of sensors that allow, for instance, people with diabetes to continuously monitor glucose levels in real time without painful finger sticks, and apps for fitness tracking and nutrition intake. We are at the tip of the iceberg of what these technologies can do.

And, we're just starting to see AI's impact on translating health data into action – from diagnosis to treatment and ultimately prevention. That's an area of great interest with potential to have enormous impact on healthcare.

How do you see the role of consumers changing in this new healthcare ecosystem?

Consumers are at the center of the healthcare transformation as active participants. Connected technologies are opening incredible opportunities for people to be more engaged in managing their own health and more empowered to make decisions about their health. Consumer access to data and products that are highly tailored to them and their needs not only allows them to have a larger say in the management of their health, it also can result in faster, more accurate diagnoses and better compliance with their treatment plans.



The FreeStyle Libre system uses a small sensor, about the size of two stacked quarters, that can be scanned discreetly with a smartphone or reader, even through clothing. Glucose levels are tracked in real-time, and users can see patterns and trends that can help them better manage their diabetes.

Which areas of healthcare do you believe are ripe for tech breakthroughs?

AI and data built into products will take them to new levels. We'll see solutions that sense changes in health and well-being without being prompted or directed. That means tools will focus on deep learning data sets, predictive diagnosis and preventive care. Implantables, wearables and diagnostics data powered by AI will come together to greatly alter how people manage their healthcare in an increasingly self-directed way.

What types of new products will help people manage chronic diseases such as diabetes or heart disease?

Our focus is on innovations that fit easily into a person's life so they can do the things they love to do without constantly thinking about their chronic health condition. We think about how to create smaller, less invasive devices that have the potential to replace medications as the first or only line of defense. For people with diabetes, our FreeStyle Libre continuous glucose monitoring system uses a sensor that can be scanned using a smart phone to let patients track glucose levels without having to stick their fingers. Our insertable cardiac monitor – the size of a paperclip, inserted just below the skin in the chest through a quick out-patient procedure – monitors heart rate and rhythm and connects people with their doctors to more accurately detect and diagnose irregular heartbeats.

How do you see the personalization of healthcare being important?

This AI-driven, smart device-powered world is changing the way we live and how we manage our care. The more personalized we can get, the more promising the benefits for healthcare efficiency and diagnostic accuracy. For example, we can analyze a patient's data to identify genetic factors associated with serious conditions and spot elevated risks of developing chronic conditions as early as possible so people can take measures to mitigate or manage the condition before it presents itself.

With the growth of traditional tech companies entering the healthcare space, what can each industry learn from each other?

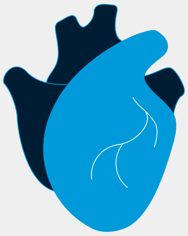
We believe there's much technology companies can learn from the healthcare industry, and vice versa. By combining our collective expertise and perspectives, we can put the right technologies together with the right sets of data to improve patient health and safety, decrease medical errors, protect patient data and privacy, and ultimately, improve the quality of healthcare delivery. Collaboration is key to the impact of advances in healthcare technologies.

Why is CES important to you?

CES brings together the world's leading thinkers and producers of consumer technology. For Abbott, a company dedicated to helping people live their best lives through life-changing technologies, it's an incredible opportunity to not only share what we're seeing and delivering, but also be inspired by what new technologies are poised to help us further our mission.

CARDIAC RHYTHM MANAGEMENT

The Confirm Rx™ Insertable Cardiac Monitor (ICM) detects irregular heartbeats. It's the first smartphone — compatible insertable cardiac monitor to support optimal diagnosis and treatment



ABOUT **Abbott**

Abbott is a global healthcare company with leading businesses and products in diagnostics, medical devices, nutritionals and branded generic medicines. From wearable sensors that track glucose levels without blood to wireless implants that send critical information about a person's heart to their doctor, Abbott is focused on advancing life-changing technologies that help people live healthier, fuller lives.

EXPERIENTIAL RETAIL

Retail isn't dead, but the game has changed. A new generation of shoppers is frequenting both real-world and online shopping destinations that make personalized connections and reduce the friction points of shopping. Whether it's to create new consumer experiences, to ease payment difficulties, to gather data that fosters customer loyalty, or to create a more efficient ecosystem, retailers who tech have a distinct advantage.

By **Robin Raskin**

Pietari Posti/Theispot.com

Top: The Starship robot provides delivery services on university campuses.

Middle: An integrated cloud infrastructure captures data to inspire new retail insights.

Bottom: Meet Marty, who's on the lookout for spills and debris at the local Stop and Shop.

Top to Bottom: Courtesy of Starship, Courtesy of McKinsey & Co., Courtesy of Stop & Shop.

NEW PARADIGMS

Native online retailers are pouring their creative juices into creating new forms of physical stores to gain insights into shopping behavior, allow customers to "feel" their wares and create ongoing loyalty. Casper, the online native mattress retailer; Warby Parker, the online eyewear store; The Away Store for luggage; Bonobos; Allbirds; and MM LaFleur ... the list of online vendors who've popped up in physical storefronts represent a large portion of new retail store openings. They're using everything in their arsenal from digital shopping tags to personalizing your purchase with high-tech fitting and measuring in order to drive consumers to shop. E-commerce companies like Harry's Shave, Flamingo and StitchFix are bringing valuable tech advances by creating replenishment models that let consumers get their "fix" with monthly subscriptions and deliver valuable data back to brands.

Research into consumer behavior has born concept stores like the Modern Retail Collective, which is actually a shopping test lab created by McKinsey and Company. Housed inside the Mall of America, the store features interactive mobile hotspots providing single-tap access to product details as well as the creation of virtual baskets. Smart mirrors and fit predictor software allow virtual trials of products outside of the fitting room. Faster future payment options include mobile and cryptocurrency capability.

Another quickly growing retail experience is the b8ta stores, designed for discovering, trying and buying innovative products. Consumers get to experience new innovations in a hands-on fashion that they wouldn't normally have. Manufacturers and makers of products garner insights about how consumers interact with the products. Since its inception in 2015, b8ta has launched over 1,000 products and is now partnering with TRU, the new ToysRus brand to overhaul the toy store experience.

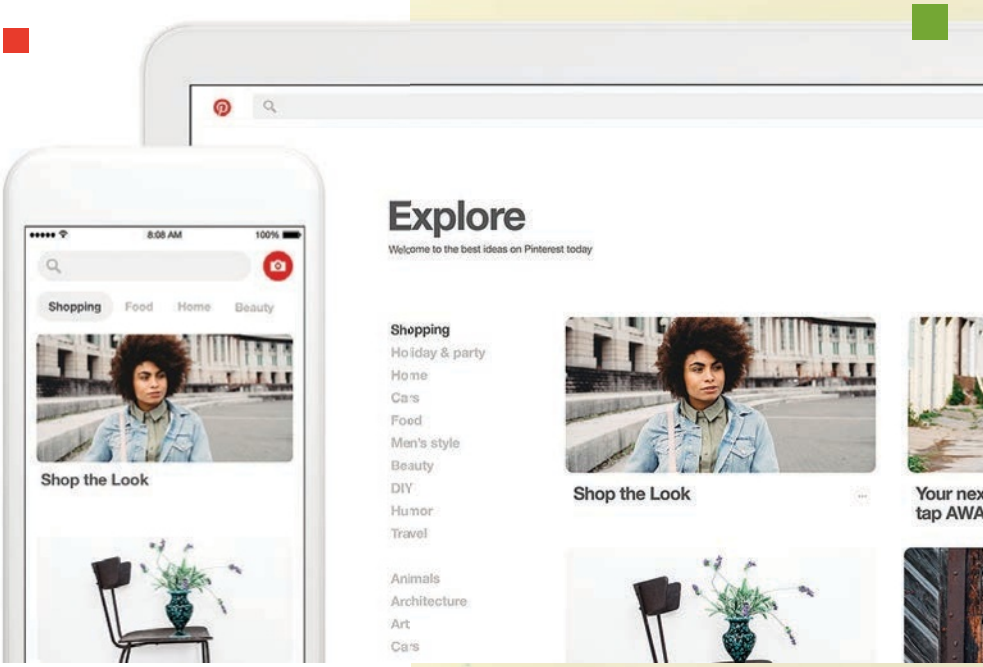
Both Modern Collective and b8ta are part of a growing number of retail as a service (RaaS) providers that mirror the software industry. Companies can now purchase solutions to speed store development. RaaS solutions bring technology to smaller providers to power online marketplaces, build out IT teams and manage inventory in addition to creating physical shops inside larger stores to test new products and services.

ROBOTS AT WORK

While many retail workers fret about jobs that will ultimately be replaced, robot optimists believe we've reached a detente where each contributes what they do best. Robots are being used in retail settings not to replace humans, but to augment, giving humans more time to offer personal interaction and services. Robots have been spotted doing everything from taking orders at restaurants to acting as baristas and bakers. For now, it's a novelty experience for customers, provides important customer feedback and also offers back-of-the-store efficiencies and even delivery.

At select HSBC banks, Pepper the robot, greets customers gathering preliminary information for the bankers, short-circuiting the tedium of the process. Pepper offers tutorials and instructions on the latest banking technologies, products and services. And of course, the #PoseWithPepper feature puts some fun into banking.

Visual Search: Pinterest's Shop the Look



Courtesy of Pinterest

At Walmart it's become commonplace to see Bossa Nova's robots checking for out of stock items, cleaning floors (think industrial-sized Roombas) and handling product unloading, scanning and sorting items from trucks. Stop and Shop introduced Marty, a robot with a built-in vision system to report (but not clean) spills, debris and other potential hazards to store employees.

Robot short-distance delivery is also being put to the test. On university campuses, robots like Starship and Kiwi's DoorDash are delivering late-night pizzas or last-minute school supplies. In the hospitality, service robots like Sheraton Hotel's Wayfinder guides you through the premises or delivers food and luggage to your room. Alibaba's FlyZoo hotel in China features facial recognition doors, robot butlers and a bar that serves drinks made by a robotic arm. And a close cousin to robots are completely unattended shopping areas, being brought to life through companies like Standard Cognition and Iris Novus.

AI GOES TO THE STORE

Data is at the heart of understanding the consumer. AI and machine learning study vast amounts of input, both human and sensor-generated to provide solutions to many problems that plague retailers. Why did my customer bail on their e-commerce purchase? How can I size this dress to fit more people realistically? How many jars of capers do I need in my store in Chicago vs. Denver?

AI employed by Walgreens helps the store reach out to customers in areas most likely to need flu shots. When combined with augmented reality (AR) and virtual reality (VR) presentation of virtual spaces to "what if" with products, AI is busy at work collecting data from those consumer experiences.

PerfectCorp's YouCam uses AI on the back end of its AR based makeup try-on experience to understand user preferences in makeup according to hundreds of different factors like skin tone, face shape and beauty preferences. Nobal's interactive iMirror ties a store's dressing room with inventory and point-of-sale (POS); the dressing room becomes your store. Spatial&, the newest portfolio company from Walmart's Store N°8, and DreamWorks Animation presents virtual reality activations to immerse shopper's in the merchandize. Using datasets, Northface customers are guided through finding and buying the perfect jacket using IBM's Watson.

THE SEARCH IS ON

One of the biggest challenges faced by brands today is making customer connections at the precise moment they need your product. Brands, always looking for better ways to be discovered and connect with buyers, are turning away from keyboard search and increasingly experimenting with voice and visual search.

Still in its nascent phase, voice search platforms like Alexa, Google Home and Siri account for a negligible percent of retail purchases, but according to a study from OC&C Strategy Consultants, is predicted to hit $40 billion by 2022. An optimistic ComScore study suggests that 50% of all search will be conducted by voice by 2020, and 31% of retail marketers perceive voice search or smart hubs (i.e.,

HOW AI CAN POWER RETAIL

Personalized decision coaches for customers

Supply chain forecasting

Efficiency and iteration of ad campaigns

Analysis of the customer journey

Tech support efficiencies

Fraud detection

Quick decision making

Pricing and forecasting

Amazon Echo, Google Home) as a trend or challenge to watch closely. Two new consortiums of technology companies promise to alleviate confusion for developers when creating tools across the brand-owned platforms as Voice use progresses.

Equally nascent, visual search at retail is capturing interest as shoppers snap photos or choose images to kickstart their shopping process. A new breed of platforms lets consumers use their smartphone's camera to snap pictures, while image recognition software delivers search results in the form of similar items. Computer vision identifies the images and creates matches to shoppable items. Retailers are busily uploading product catalogs as images, digitizing them through proprietary technology or third-party providers such as Slyce Interactive to drive sales, particularly with digitally native younger shoppers who are more likely to transact on mobile.

Google is a dominant player in visual search with Google Images responsible for 21% of image search, according to Sparktoro research. Amazon is quickly becoming a big competitor when it comes to Search as more consumers start looking for products there than a traditional search engine. And visual search can give the advantage to image-heavy social media platforms like Instagram and Pinterest. Pinterest's Lens function more accurately identifies items from a Pinned image and makes those pins shoppable.

It's only a matter of time before purchasing what you see becomes commonplace.

MEASURING HUMAN BEHAVIOR

Tools for measuring shopper engagement are also getting more granular. Tracking eye-movement, facial reactions and bodily responses like GSR give researchers a look at customer engagement, retention and reaction to a wide variety of questions. Eye tracking can be done in the real world by asking consumers to wear special glasses while they shop or in lab settings where consumers use VR headsets to simulate real-world shopping. Facial expressions like frowning or arched eyebrows can signify a shopper's displeasure or surprise. As eye tracking gear becomes more miniaturized, you'll see the technology become more convenient and pervasive.

Location-based analytics have evolved from geo-fencing to more refined spatial identification inside stores pairing sensors and shelf tags with mobile devices. As consumers increasingly download apps and join retailers' loyalty programs, they have opted into programs that shift tracking from anonymous to identified. That's why merchants such as Target and Nordstrom have transitioned credit card-based loyalty programs to the more structured closed-loop Target Circle and Nordy Club programs accessible to a larger population. Retail is changing to provide consumers with a more customized experience wherever they shop. ■

USES OF BIOMETRIC FEEDBACK

Product Placement

Product Packaging

Display Signage

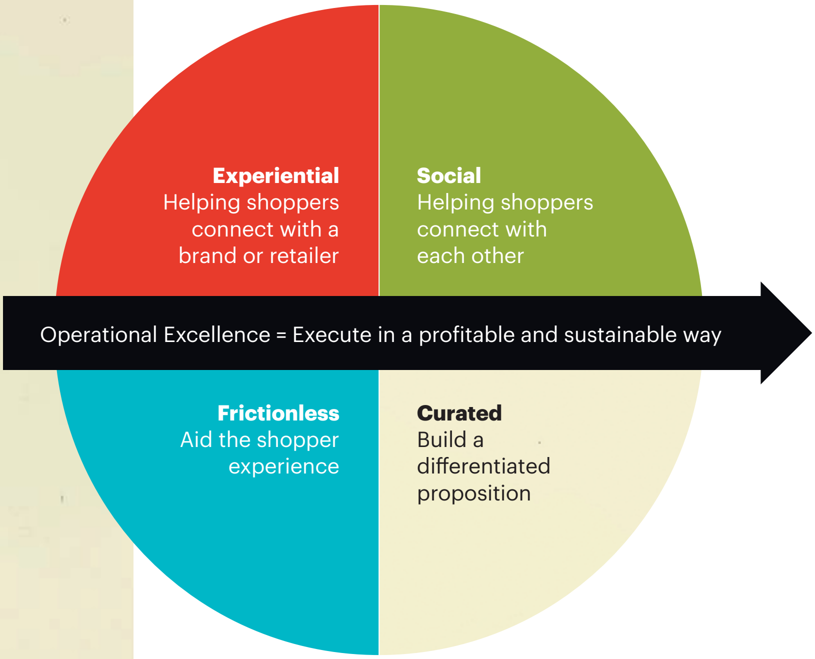
Website Design

Website Usability

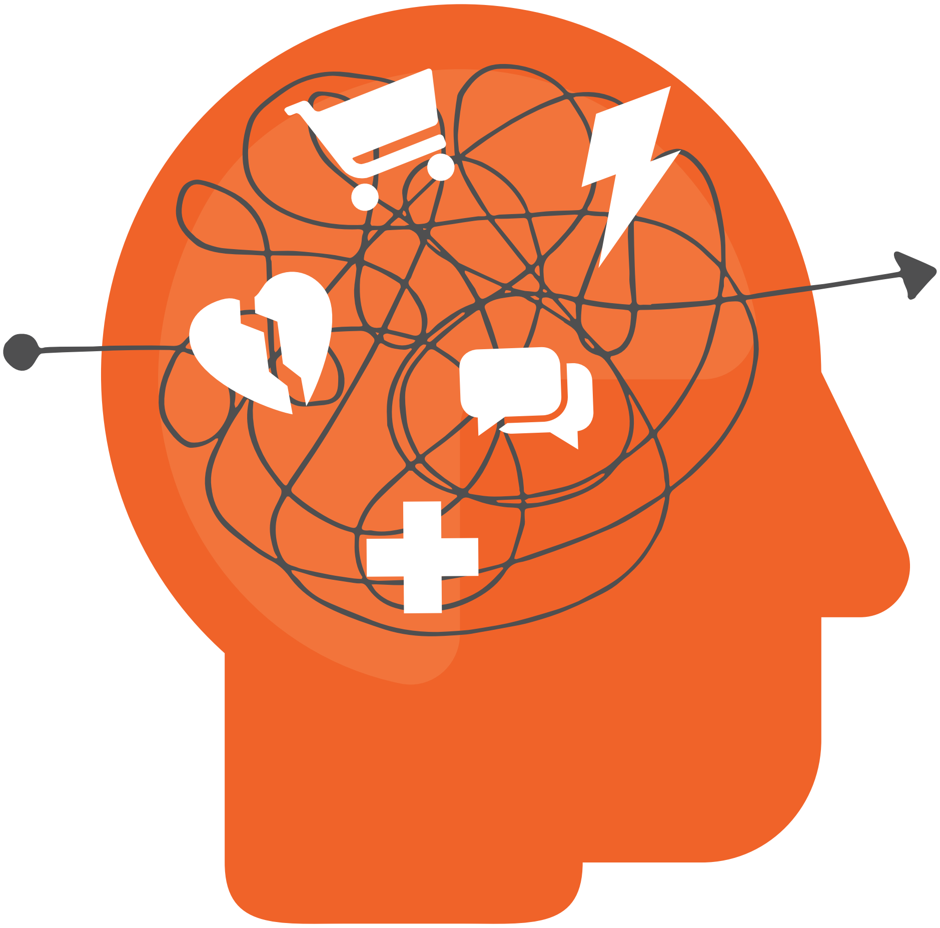
Store Concepts

Product Satisfaction

THE STORE OF THE FUTURE WILL BE DEFINED BY FOUR MAIN CHARACTERISTICS


Experiential
Helping shoppers connect with a brand or retailer
Social
Helping shoppers connect with each other
Operational Excellence = Execute in a profitable and sustainable way
Frictionless
Aid the shopper experience
Curated
Build a differentiated proposition

Source: Ascential Edge



WHO’S MOST STRESSED

And how tools that help you navigate the health care system can provide relief

BY BRENDA YANG

STRESS IS INEVITABLE — that’s a given. And it’s not always bad. But a growing body of research shows that stress affects different groups in different ways, which can have big consequences.

We recently looked at survey data from more than three million Rally® users that shows that women are more stressed than men, and younger people are more stressed than older folks — particularly Generation Z, which is just entering the workforce. Three-quarters of Gen Z members say they are overwhelmed by stress, at least sometimes, and millennials are right behind them at 70 percent.

We know this because our members tell us. Nearly 55 million consumers have access to the Rally digital health platform through more than 200,000 employers. Many of our members take a health survey that looks at age, weight, and key health data, as well as things like stress levels, fitness, and eating habits. It’s all very cool and sciency, and it yields fascinating insights that help us help our users take charge of their health. (Check out the infographic on the next page for more details.)

MORE STRESSED THAN EVER

The biggest culprit? It’s most likely their jobs. (I’m sure we can all relate.) In fact, 40 percent of American workers say their work is “very or extremely stressful,” according to this survey by Northwestern National Life, which is cited by the Centers for Disease Control and Prevention, to give you an idea of its weight.

The same CDC report also mentions research by the St. Paul Fire and Marine Insurance Co., which found that problems at work are more strongly associated with health complaints than are financial or family problems. And in a 2018 study of 2,000 professionals by the consulting firm Korn Ferry, nearly two-thirds of them said their work stress levels were higher than they were five years ago.

The demands that characterize the modern work world may contribute to a host of long-term health issues. When a tight deadline, annoyed boss, irritated customer, or angry email pops up, your brain responds with the same physiological reaction it would have cued when being chased by a predator thousands of years ago. The nervous system goes on high alert and stress hormones like adrenaline and cortisol begin to flow, preparing your body to run away from the threat or fight back.

A stressful environment doesn't exactly help productivity, either. Instead, stressed-out employees suffer higher rates of illness, injury, absenteeism, and turnover — costing US employers billions of dollars annually.

> You have to put on your own oxygen mask first — because if you run out of air, you can't help anyone else.

Women may feel more stress than men because of family obligations, including taking care of children and/or aging parents. They often spend more time taking care of others rather than meeting their own needs. But as we become more aware of the mental and physical havoc stress wreaks, health professionals increasingly remind us of the airplane metaphor: You have to put on your own oxygen mask first — because if you run out of air, you can't help anyone else. Similarly, if you don't take care of yourself, you won't be able to care for your family if you become burned out.

Panel Discussion With Katie Couric

Join superstar journalist Katie Couric for a panel discussion on how digital navigation is the essential element in health care, featuring Rally COO Brenda Yang and TV host/Rally Health Ambassador Maria Menounos.

11:30 am | Tuesday, January 7
Venetian, Level 4, Lando 4305

Q&A

Three Questions for Brenda Yang

Brenda Yang is Rally's chief operating officer, overseeing company-wide operations, driving strategy and company performance overall.

WHAT'S YOUR FAVORITE WAY TO DE-STRESS?

A: There's nothing like a good run to clear your mind, and I like spending time outdoors with my family. I also meditate at least 10 minutes a day. There are some great apps for that now.

FLU SHOT — YES OR NO?

A: Definitely yes. It's such an important way to keep me and my family healthy during flu season.

WHAT ARE YOUR 2020 GOALS?

A: Help even more people engage with the health care system in the easiest way possible. On a personal level, travel is one of my passions, so I'm hoping to find time to explore new places with my family.

This is where Rally comes in. Our flagship digital health platform delivers web and mobile solutions that help people navigate their health care needs and employee benefits. Our motto is Your Health Made Simple, and we are relentlessly focused on making it easier for people to manage their health care and well-being. In other words, we help you put on your oxygen mask. In addition to supporting your physical health, we connect you to mental and behavioral resources to help you with your overall well-being.

FINDING YOUR WAY

At Rally, we believe taking care of yourself shouldn't cause more stress. We also understand that finding the right health care providers and services at the right cost is a critical step in avoiding that overwhelmed feeling. That's why we've built a platform that helps people engage in their daily health, deal with chronic health challenges — including stress — and generally navigate the health care system.

We do this by meeting you where you are — which, of course, is online or on your phone. Rally puts your health in your hands by helping you find a doctor in your network or an urgent care clinic that might be better for you than a stressful, expensive trip to the ER. And after you've been to the doctor, Rally helps you get your medications, see your results, and manage your medical bills.

> Taking care of yourself shouldn't cause more stress — finding the right health care is a critical step in avoiding feeling overwhelmed.

We also connect you to simple-to-schedule virtual visits— great for things like counseling or a pediatrician consult — plus a tool that shows you doctors' patient reviews, quality ratings, and what a visit will cost.

And we offer evidence-based online coaching programs that can help you lose weight (Real Appeal®) and quit smoking (Quit for Life®). If you have surgery, we help reduce the stress of post-operative care and communication with your doctor via Rally Recover. It's currently designed for patients recovering from certain orthopedic, spinal, and cardiac procedures, and will eventually include other surgeries.

Everything we do is based on the idea of taking small, manageable steps that move you closer to your health goals — call it the Next Best Action. If your everyday lifestyle could be better, we offer programs that can help you move more, eat better, get more sleep, and put down that phone an hour before bed.

If you're already in good health, Rally encourages you to take the next best action and bump up your weekly gym visits. If you haven't seen a doctor in ages, we'll help you take the next best action by finding in-network providers, scheduling appointments and paying the bills — all online.

Another way we encourage you to take the next best action is by offering rewards for everything from logging your workouts to managing a chronic condition or having a primary care doctor. And we offer an integrated, easy-to-use tool to fill your prescriptions — while helping you keep an eye on the costs.

> No more logging into a million portals, no more forgetting passwords and locking yourself out.

Our next-generation digital platform lets you access your health care, financial, and well-being benefits in a single experience that spans multiple systems and health payers. No more logging into a million portals, calling employee helplines, and still not understanding how to access the care you need or how much it will cost.

Even better? No more forgetting passwords and locking yourself out. Rally's single sign-on allows you to log in to your health-related accounts with just one username and password. As a mom, I can't tell you how helpful this all is.

We can't eliminate all the stressful factors in your life. But by pulling together all your health benefits and information to help you understand and best utilize your options, we like to think we're making your life easier and making you a lot more empowered.

Now take a deep breath — you've got this.

Come See Us in Person

Experience Rally for yourself in the lobby outside the CES Digital Health Summit at the Sands Expo. Post a photo there using #RallyHealthCES and get a gift on us, while supplies last. You can also pick up a free copy of the Rally Magazine, which is filled with tips on food, fitness, health care, and mental well-being.

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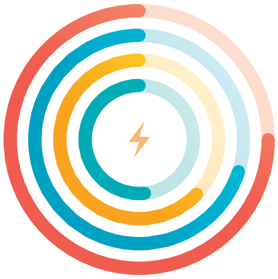
Stressed Out?

Stress doesn't always mean something is amiss. Your body is hard-wired to react to stressful situations. But what if you always feel on edge? Chronic stress is a contributor to a host of long-term issues. More than two-thirds of Rally members feel stress is affecting their health. But some groups are hit harder than others.

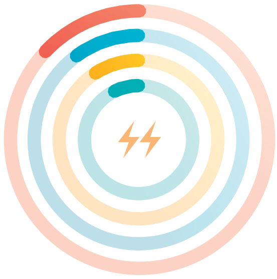
THE GENERATIONAL DIVIDE

Though Gen Z, the youngest age group, was a smaller part of the Rally survey, their stress levels weren't small at all. Millennials were a close second. The younger generations are also stressed about money.



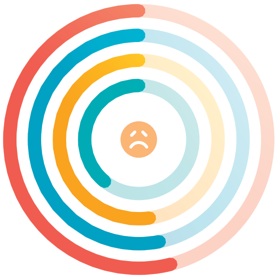
Overwhelmed by stress at least sometimes:

75% GEN Z	70% MILLENIALS
64% GEN X	52% BOOMERS



Report that stress is affecting their health "big time":

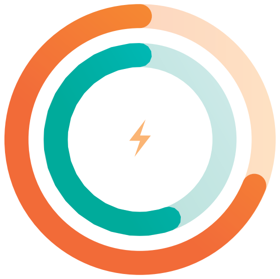
14% GEN Z	10% MILLENIALS
9% GEN X	8% BOOMERS



Worry about making ends meet at least sometimes:

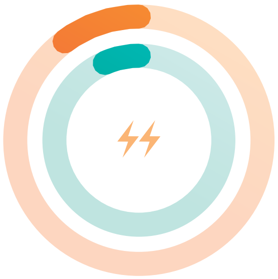
54% GEN Z	53% MILLENIALS
52% GEN X	40% BOOMERS

THE GENDER GAP



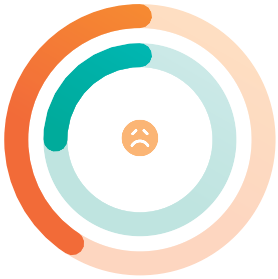
Women are more likely to be overwhelmed by stress at least sometimes:

69% WOMEN	55% MEN



And women are more likely to report that stress is affecting them "big time":

10% WOMEN	7% MEN



Stress is linked to depression, which is also more common among women:

40% WOMEN	25% MEN

About Rally

Rally Health, Inc. is a consumer-centric digital health company that makes it easy for people to take charge of their health. We partner with health plans, health care providers, and employers to engage consumers. Our flagship is Rally®, a leading digital health platform that delivers web and mobile solutions to help people manage their health and well-being, employee benefits, and health care needs. Nearly 55 million consumers have access to the Rally platform through more than 200,000 employers and health plans, including UnitedHealthcare, BlueCross BlueShield of South Carolina, and Health Alliance. For more information, please visit RallyHealth.com.

Solving the Big Problems in Health Care

Listen to Rally Chief Product Officer Chris Carey talk about why it all comes down to engagement. Find the CES podcast at RallyHealth.com.

THE CAR COCKPIT OF THE FUTU

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Courtesy of Byton

RE

By **Robert E. Calem**

Automakers and their suppliers are rethinking mobility for the 21st century and are revising car interiors to add personalization features while removing distractions. Prominent displays and app integration are key components in this endeavor. But now, those are complemented by more inconspicuous tech, including in-cabin sensors for detecting a driver's or passenger's mood and human-machine interfaces (HMIs) that stay hidden until needed. More, the coming proliferation of battery electric vehicles (BEVs) and self-driving cars will propel this evolution of car interiors, giving occupants new ways to interact with the vehicle as well as with each other.

Some of these innovations were seen at CES in recent years. Others are debuting at CES 2020.

PERSONALIZATION YIELDS SATISFACTION

Up to now, consumers have not had a compelling reason to adopt BEVs. The auto industry has focused on emphasizing increased range or charging speeds, says Kristin Kolodge, executive director of driver interaction and human machine interface research at J.D. Power in Troy, MI. However, with regard to interiors, Kolodge asserts, "these new mobility options" like BEVs and self-driving cars present "a potential white space opportunity to rewrite the script." Self-driving cars open time spent in the vehicle to "different type experiences," rendering usefulness even more important, she says.

"For technology that is on the road today, we see consumers making a very clear delineation with respect to what technology is actually useful — worth the money they spent on it — and that quickly catapults itself into what technology do I want tomorrow," Kolodge says.

Power's *2019 U.S. Tech Experience Index (TXI) Study*, released in August, indicates apps built into cars are not meeting users' expectations. The attribute for "ease of using built-in apps" ranked lowest (7.63 on a 10-point scale) in the entertainment and connectivity category, and 29% of vehicle owners have stopped using their cars' built-in apps altogether, the report says. The study also found consumer concern around self-driving car tech plus annoyance with current advanced driver assistance systems (ADAS) technologies. Among owners of vehicles equipped with lane-keeping and centering systems, on average 23% consider the associated alerts annoying or bothersome, according to the study. Of those respondents, 63% want the feature in their next vehicle, versus 91% of respondents who weren't put off by the alerts, Power says.

So, the auto industry "will be at a crossroads going forward with self-driving cars," needing to retain customers'

attention to the car with better in-cabin technology — not favoring a brought-in device — when they're no longer piloting, Kolodge maintains. Displays stay relevant in future car interiors, but their roles change, she says. Instead of being dedicated to one context, they'll enable personalization via interchangeable purposes, she explains.

"Maybe you can't make your car a living room on wheels yet, but you can still repurpose a lot of the smart home experience within, say, a semi-autonomous vehicle," says James Hodgson, principal analyst at ABI Research in Wellingborough, U.K. This accounts for the emergence of digital assistants like Amazon Alexa and Google Now in autos, he says. Going forward, in-cabin cameras and radars installed for driver and passenger monitoring systems will be leveraged for "emotional intelligence," too, enabling the car to proactively respond to the user's mood by adjusting lighting or the music that's playing. He also foresees biometric technology allowing the car to identify everyone inside it, giving each person access to his or her own content, cloud-based services or settings.

At CES 2020 Hodgson anticipates more focus on this technology in cars. "The automotive industry is scrambling to show things of value in the short and medium term rather than moonshot ideas," he declares.

> **"What people want to do inside the car will drive how the interior will be structured, and it will enable experiences based on that."**

Indeed, automotive emotion recognition through artificial intelligence (AI) is "literally the premise on which we developed our technology starting in 2014," says Modar Alaoui, founder and CEO of Eyeris, based in Palo Alto, CA. Employing multiple in-cabin cameras and an AI chip from various hardware partners, the company's technology features 10 computer vision neural networks running in parallel to analyze human behavior — from upper body, face and activity — in relation to objects and surfaces in real time, Alaoui explains. The addition of object recognition and surface classification neural networks to Eyeris's existing portfolio of human behavior understanding algorithms results is "in-vehicle, scene-understanding AI" that enables the car to adapt to what's going on inside it, he says. This is a "renaissance of the in-cabin space, which never before generated any type of meaningful data that could optimize safety and enhance comfort and convenience."

Eyeris announced its human behavior understanding technology at CES 2018 and recently introduced the first fully integrated system that integrates combination RGB-IR cameras. At CES 2020 it will demonstrate its system in a Tesla Model S concept car outfitted with eight RGB-IR cameras that, when in production, will be smaller than a cell phone camera.

Eyeris has worked with automakers Honda, Jaguar Land Rover, Mitsubishi and Toyota, and with auto industry Tier 1 suppliers including Bosch. Two more partners will be revealed at CES 2020, and the first production vehicles with Eyeris' technology built in will roll off assembly lines starting in 2022, Alaoui says.

DESIRE MOTIVATES CHOICE

From steering wheels to seats, car interiors have remained essentially unchanged along with the use case of a driver and passenger(s) or cargo. Looking ahead, "there's a paradigm shift," says Alexander van Laack, director of the "cockpit of the future" platform at Faurecia North America, based in Auburn Hills, MI. "What people want to do inside the car will drive how the interior will be structured, and it will enable experiences based on that."

So, when cars are entirely self-driving, van Laack suggests, the interior could be turned into a complete gaming console, where air conditioning, seating vibrations and fragrance infusion all become part of the game environment and stimulate perceptions. Or, because humans are "multimodal," stimulating senses may turn the interior into a sort of wellness spa, he says. Faurecia demonstrated this at CES 2019 using seat vibrations combined with music, and the company is also highlighting this at CES 2020.

Seats are evolving, too. At CES 2019, the company showed how they can move, pivot and recline in novel ways while remaining safe, with seatbelts affixed to the seat structure and integrated motors that bring a person upright in the event of an impending collision.

Top: Courtesy of Faurecia. Right: Courtesy of Byton (2)

A look at Faurecia's vehicle cockpit of the future.

"We're looking at seats as the cradle of experience in the car," says John Absmeier, chief technology officer at Lear Corp., headquartered in Southfield, MI. Thus, he says, Lear is exploring "the new SaaS business model: Seat as a Service," which brings content and functionality that can be delivered on demand, provided as an option at the time of use instead of at the time of sale.

"If you think about the content that we put in seats today, like massage, heating and cooling and connectivity — most of those things are a one-time sale" when the vehicle is ordered and built, Absmeier says. "In the future, it would make sense to put all of the content in these shared vehicles — that are going to be used for different use cases, for different consumers — and then it can be monetized an as-a-service business model," he says. "You might have landed in Arizona and it's very hot so you might be willing to pay a little bit of an upgrade charge to ride in a car with a cooled seat."

Lear's SoundZone technology integrates Wi-Fi and Bluetooth in a seat for connecting a personal device and using that to listen to streamed music, have a private conversation or watch a video.

A coming Lear seat enhancement adds sensors to the car seat that allow it to adjust itself in response to the user's perceived needs. "It's understanding your muscles, and your movements, and potential discomfort situations," Absmeier explains. "It's also understanding driving conditions," including whether the road is bumpy or there are curves, and how long the driver has been sitting and the implications this has for blood circulation. Consequently, he says, the seat may alter its own lumbar support or side bolster, or even recline or raise its backrest "to make you remain comfortable, in many cases before you go to adjust it yourself."

This ties into another concept for future car interiors, which is smart surfaces that can act as controllers or sensors. Those coming proactive comfort sensors potentially may be radio frequency-based heart rate or respiration monitors built into a seat.

Similarly, Absmeier says Lear is working on ways to integrate lighting in seats that would help to alleviate motion sickness in a car.

Lear is a dominant player in the automotive seating business. It generates $16 billion of annual revenue in the category by providing everything from structure through foam, trim and surface material to final assembly.

BYTON AT CES 2020

BYTON is unveiling a production-ready version of its semi-autonomous battery-electric SUV, the M-Byte, first shown as a concept at CES 2018. The interior's technology fittings remain entirely true to the original plan. But some surprises are to be revealed, too, promises Andre Nitze-Nelson, director of future digital product experience at BYTON.

"The idea is to build and develop a platform in two ways. One is the platform as a car," Nitze-Nelson says, and the other is a "digital product." He says, "it must be scalable and designed in a way that it will work in the future without redesigning the entire architecture." And to that end, he says the vehicle's interior and HMI (human-machine interface) was designed around the notion that "everyone in the car is an equal user," and that the "driver" will eventually be relegated to the dustbin of history.

The front seats rotate inward 12 degrees to facilitate conversations — a pioneering feature in the auto industry that required collaboration with the seat supplier, Nitze-Nelson notes. The unique 48-inch wide curved Shared Experience Display (SED) sits atop the dashboard and is composed of three segments for consuming content. It's not a touchscreen; its controller is an eight-inch touchpad mounted in the center console between the front seats, which is easily accessible to the front passengers.

Of course, there are driver-centric features and controls, including a seven-inch steering wheel-mounted tablet that can be navigated with thumb swipes. It functions as the driver's SED controller and provides access to the vehicle's infotainment system but can also double as a "consumption display" when parked, Nitze-Nelson says.

BYTON ID is a cloud-based account that lets anyone bring their personal vehicle settings to any BYTON vehicle anywhere — a concept that is tailored to BYTON vehicles used by car-sharing or ride-hailing services.

"Imagine you have access to something which tracks your movement or activities," he says. "Now you connect these two accounts and your BYTON ID allows full access even in a car you do not own. You jump in a car, we have facial recognition, we can recognize you and if so, your user profile unfolds in that very moment. "

The vehicle on display at BYTON's booth is "a representation" of the model that will go on sale in the U.S. next year, but it is 99.9% accurate, and what may change won't be noticeable to a casual observer, Nitze-Nelson says. Visitors can interact with both the actual vehicle and a "buck" in which they can sit and explore the SED's functions for themselves.

Lear seats adjust themselves to users' perceived needs.

Courtesy of Lear Corporation

Lighting and smart surfaces are subsumed under another trend overtaking car interiors — namely 3D in touch, sound and visual user experiences, says Tamara Snow, head of the systems technology group for interiors, North America, at Continental Automotive in Troy, MI.

At CES 2018 Continental displayed 3D surround sound with actuators built into vehicle surfaces, as well as 3D surfaces used as displays (which won a CES Best of Innovation award). At CES 2019, the company showed an augmented reality (AR) head-up display (HUD) and morphing surfaces, on which 3D controls light up and pop up when a user's hand approaches — the latter a form of "shy tech" that appears only when necessary. It also debuted a 3D Lightfield center stack display, which will be at CES 2020, Snow says. In July, Continental partnered with Leia Inc., a Silicon Valley startup, to produce a Natural 3D Lightfield Instrument Cluster, slated to be in cars for sale by 2022.

The 3D Lightfield technology is relevant for future self-driving robotaxis because it can provide a 3D user experience for all passengers in a vehicle, not just the person who's sitting in the traditional driver's seat, Snow says. And when car cabins are reconfigured for all passengers, it accommodates moving the content from one 3D display zone to another, she adds. It can also become a holographic display for navigation or parking assistance.

Also, at CES 2020, Continental is showing the combination of displays inside the cabin with surround-view camera systems looking outside for "clear visual perception of spatial relations." Its Transparent Hood technology gives a virtual view through the hood of the car, and for which the company won a CES 2020 Innovation Award. It's now available in the 2020 Range Rover SUV from Land Rover.

Transparent Hood is related to another Continental 3D display technology that hasn't been put into a production vehicle yet, the Virtual A-Pillar. Using a flexible OLED display, head tracking and surround-view cameras, Virtual A-Pillar visually cuts out the front side support structures thus eliminating another common forward blind spot.

Bosch is also showcasing some of its display developments at CES 2020, on a large wall that represents a car's dashboard. The purpose is to illustrate how different technologies can be interactive from an end user's point of view.

Bosch also envisions 3D displays in the car cockpit of the future, says Robert Finger, director of product management for car multimedia at Robert Bosch GmbH in Stuttgart, Germany. They're better to emphasize the importance of warnings and provide depth perception for navigation, or as a mirror replacement when paired with a 3D camera.

In fact, displays or touch surfaces can replace almost all hard buttons in a car's cabin, Finger says. They can be woven materials and placed in a seat or armrest. And in the realm of in-cabin monitoring, the company agrees about the utility of RGB-IR cameras for obtaining a better contextual view and analysis, Finger says. But it also sees use cases, including for videoconferencing from the car.

Continental's Snow declares, "the car becomes much more than just your mode of transportation. The transportation almost becomes the background of what's happening — it's foundational — and then you can do a lot more on top of that." ■

MERCEDES-BENZ AT CES 2020

Mercedes-Benz will showcase a groundbreaking concept car that incorporates a completely new form of interaction between humans, technology and nature — presented in a keynote by Ola Källenius, chairman of the board of Management of Daimler AG and head of Mercedes-Benz. Källenius is carrying on a tradition started in 2007 by Alan Mulally, then CEO of Ford Motor Co., who used the CES keynote stage to debut SYNC, an unprecedented infotainment system co-developed with Microsoft.

CES is now a major auto show — having been named one of *USA Today's* 10 Best Auto Shows — and hosts more than 140 exhibitors representing the entire vehicle technology ecosystem. These include 10 major automakers, top automotive industry suppliers, self-driving car tech companies and automotive software companies.

CES 2020 Ola Källenius, chairman of the board of management of **Daimler AG** & head of **Mercedes-Benz Cars**, and U.S. Secretary of Transportation Elaine Chao will keynote at CES. Also visit the **Self-Driving Technology Marketplace** (LVCC, Platinum Lot).

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Hey Google, is the garage door open?

Okay, checking. The garage door is open.

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I Like Me Better
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By **John Gaudiosi**

DOUBLING DOWN ON ESPORTS

Call of Duty League launches in 2020, expanding on the success of *Overwatch League*

Activision Blizzard continues to invest heavily in its esports division, taking a page from traditional sports leagues by connecting its bestselling game brands like *Call of Duty* and *Overwatch* with cities like London, Paris, Toronto and Seattle.

The recent *Overwatch* League 2019 Grand Finals, held at the Wells Fargo Center in Philadelphia, crowned the San Francisco Shock champions with $1.1 million. The tournament attracted 1.12 million viewers per minute across multiple global platforms including Twitch and ABC Network in the U.S. That marked a 16% increase over viewership of last year's inaugural Grand Finals.

The league averaged 313,000 viewers weekly in the coveted 18-34 age demographic, which was up 11% over 2018. In addition to garnering more viewers week to week than traditional sports organizations like Major League Soccer and Major League Baseball, this audience growth was the only increase in all the major sports leagues in 2019.

Now Activision Blizzard Esports is following the *Overwatch* League blueprint with *Call of Duty* World League (CWL), which kicks off this year with five-vs-five professional match play. The inaugural 12 teams include Atlanta, Chicago, Dallas, Florida, London, Minnesota, New York, Paris, Seattle, Toronto and two Los Angeles squads.

Along with playing both home and away games, each team in the league will host two Home Series weekend events in their respective markets: one in a spring split and a second during a summer split. Multiple pro teams will compete on Sony PlayStation 4's at each Home Series event, giving fans a range of must-see competition throughout the weekend. In between the spring and summer splits, the league will host a special *Call of Duty* League Midseason Weekend event where all 12 teams will be featured in special all-pro tournaments.

Clockwise from top: Robert Paul for Blizzard Entertainment, Courtesy of Activision, Robert Paul (2).

OWN

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Call of Duty Modern Warfare.

From Top: *Overwatch* League 2019 Grand Finals; Middle and bottom: Call of Duty World League Finals in Miami.

CALL OF DUTY MOBILE SHOOTS FOR SUCCESS

Over 100 million people downloaded Activision's *Call of Duty Mobile* free-to-play game in the first week of its October 4 launch. Developed by TiMi Studios in partnership with Tencent, the first-person and third-person shooter was designed from the ground up for Android and iOS devices.

The game includes full head-to-head competitive multiplayer modes, as well as an original Battle Royale experience, including classic locations from *Call of Duty*.

COD obliterated launch numbers for some of the most popular franchises on mobile, including *PlayerUnknown's BattleGrounds (PUBG)*, which achieved 28 million downloads within the first week of launch, and *Fortnite*, which had 22 million downloads on iOS only.

"We have a great advantage with having *Overwatch* League within our Activision Blizzard Esports family and have learned a great deal from their experiences," said Johanna Faries, *Call of Duty* League commissioner. "In addition, we are bringing in entirely fresh elements that are specific to the global entertainment juggernaut that is *Call of Duty*."

Activision has been growing its global *Call of Duty (COD)* footprint with CWL over the past few years. The game maker has worked with consumer technology companies like Astro Gaming, Asus, Mountain Dew Amp, Scuf Gaming, Sony, TCL and T-Mobile as sponsors for the league.

Faries said the possibilities for consumer electronic companies to get involved in what Activision Blizzard Esports is building are truly endless.

"We are a technology-driven experience, and our players and fans are digital natives who expect and deserve innovation across the board. *Call of Duty* League exists to 'deliver the unexpected,' and that brand purpose includes delivering best-in-class technology and innovation experiences as often as possible," added Faries.

This year's CWL Finals took place at the UCLA Pauley Pavilion in Los Angeles. The nine-hour broadcast was watched for 716,000 hours on Twitch with a peak of 117,453 viewers. The championship awarded $6 million in prize money and saw eUnited defeat 100 Thieves in the Grand Finals.

The one element that separates COD from other esports titles like *Overwatch*, *League of Legends*, *Counter-Strike: Global Offensive* and *Dota 2* is that the game completely changes every year. While other esports will update and tweak the existing game clients, *COD* competitors play the latest annual version of the game, even when it's brand new. The new league will be playing *Call of Duty: Modern Warfare*, launched on October 25, 2019.

In addition to pro play, the league will continue to foster the growth and development of emerging player talent with *Call of Duty* Challengers, its amateur path-to-pro competition system. *Call of Duty* Challengers, which began in November 2019, runs through 2020. It includes online ladders, online tournaments and open tournament event competitions with a dedicated prize pool of over $1 million. Several *Call of Duty* League pro teams will also support amateur player pipeline development by hosting *Call of Duty* Challengers competitions in their markets.

Fans can also compete on behalf of their cities in a new, casual competition system called the *Call of Duty* League City Circuit. In the City Circuit, fans compete on behalf of their favorite pro team cities through online or LAN (local area network) tournaments held exclusively by the 12 *Call of Duty* League teams. This fan-focused competitive circuit features a two-on-two format in the *Call of Duty: Modern Warfare* mode "Gunfight." *Call of Duty* League City Circuit carries its own prize pool and will culminate in a finals event at the Call of Duty League Championship Weekend.

"After returning from the first owners' meetings I was blown away by the plans

ESPORTS BY THE NUMBERS

A major milestone was crossed in 2019 when for the first time, the global esports market exceeded the billion-dollar revenue mark. The $1.1 billion in revenues accounted for a year-on-year growth of 26.7%. Around 82% of the total market ($897.2 million), came from endemic and non-endemic brand investments like media rights, advertising and sponsorship. The highest-grossing individual esports revenue stream worldwide was sponsorship, generating $456.7 million last year. The fastest growing esports revenue stream by far is media rights, advertising and sponsorships, according to research from Newzoo.

"Esports' impressive audience and viewership growth is a direct result of an engaging viewership experience untethered to traditional media," said Newzoo CEO Peter Warman. "Plenty of leagues and tournaments now have huge audiences, so companies are positioning themselves to directly monetize these esports enthusiasts. While this began happening in 2018, the market is constantly expanding on its early learnings. The result: 2019 was the first billion-dollar year for esports, a market that will continue to attract brands across all industries."

$1.1B

in revenue for 2019

50%

growth in viewership between Q3 2018 and Q3 2019

According to Simon Kemp, CEO of Kepios and chief analyst at DataReportal, nearly one billion people globally are watching video game tournaments today. That's twice the size of the global audience for Formula 1 racing, eight times larger than the TV audience for MLB's World Series and 10 times bigger than the audience for Super Bowl LIII.

That viewership grew by nearly 50% between Q3 2018 and Q3 2019, with 22% of all internet users saying they had watched an esports tournament in recent months. Viewership grew by 60% in the younger 16-24-year-old demographic.

Courtesy of Epic Games

Activision has for *Call of Duty*," said Amish Shah, founder of RekTGlobal, Inc., which owns the London Royal Ravens *Call of Duty* League franchise. "London is where the best crowds and tournaments have been for *Call of Duty* and we can't wait to have our first home games in London in February and June 2020. The resources being thrown behind the game and league is mind-blowing and we are excited to be a part of it."

Daniel Cherry, CMO of Activision Blizzard Esports, said these leagues give the company a platform to enhance and bring world class entertainment to the masses through live competitive entertainment and attract new fans.

That's one reason traditional sports owners like the Wilf family (Minnesota Vikings), Sterling Equities (New York Mets) and Kroenke Sports and Entertainment (Los Angeles Rams, Denver Nuggets, Colorado Avalanche and the MLS Rapids) are jumping into the esports arena.

"It's tremendously helpful, especially as it relates to building teams, local fan bases, hosting events, sponsorships and all the models that drive traditional sports," Cherry said. "I come from a traditional sports background myself, and we are customizing and applying learnings from traditional sports to esports, but also giving it its own unique spin, as competitive video games and their fans deserve it. There are similarities, but there is also a uniqueness that traditional sports marketers and operators can learn from as well," said Johanna Faries, Commissioner of the *Call of Duty* League.

Coming from the NFL, Faries witnessed the power of giving fans a reason to cheer for their favorite cities through the sports and teams they love.

"Applying that formula here, coupled with tremendously experienced ownership groups who hail from esports, traditional sports, and entertainment more broadly, gives us a unique opportunity to do something groundbreaking in the industry," added Faries.

This year is just the beginning for *Call of Duty*, as it follows *Overwatch* and other esports juggernauts into a future that will see professional gaming become more mainstream.

"It's going to continue to grow," said Cherry. "Our audience continues to grow, as does our viewership. Both leagues will be hosting live events all around the globe in 2020. There is no limit to what is possible with esports, I can't wait to see how we continue to tweak and improve our models in the seasons to come." ■

2019 was the first billion-dollar year for esports, a market that will continue to attract brands across all industries.

CES 2020 New this year, esports — a part of the sports technology experience — will be at C Space in ARIA.

FORTNITE STILL HAS FIGHT

Fortnite remains king of the battle royale genre after two-and-a-half years of multiplayer competition. With over 250 million registered players across every imaginable device, *Fortnite* remains a key strategy for Epic Games, as well as a way to share some of the free-to-play game's wealth with its community.

Over 40 million players participated in the game's biggest event to date, the *Fortnite* World Cup in New York. The best *Fortnite* players in the world met July 26-28 to compete in the $30 million *Fortnite* World Cup Solo and Duos Finals, $3 million Creative Finals and $3 million Charity Pro-Am. This event was the culmination of 10 weeks of $1 million Online Open Qualifiers with more than 200 countries participating.

Over 19,000 fans attended the three-day *Fortnite* World Cup Finals in person at the sold-out Arthur Ashe Stadium. On Sunday during the Solo Finals, concurrent viewers peaked at over 2.3 million across YouTube and Twitch, making the *Fortnite* World Cup the most-watched competitive gaming event (excluding China) of all time. These numbers do not include fans watching in-game and on other streaming and social media platforms. That's right: Epic allowed gamers to play *Fortnite* while watching the World Cup action picture-in-picture.

Epic gave away $100 million in prize money to its massive *Fortnite* community in 2019, and the game maker continues to refine its esports program with even more competitive options for 2020.

Smart Vehicle Architecture:
Making the Future of Mobility Work

By Lee Bauer

Think about all the features you have at your fingertips in your car. Power windows. Bluetooth capabilities. Cruise control. Automatic headlights and windshield wipers. Because these features are easy to operate and are seamlessly integrated in the vehicle, it's easy to forget about the vast ecosystem required to make it all functional.

Typically, new vehicle features have been added in a modular fashion. From the Model T to the Model 3, we've been adding features the same way. What's the result of this process? Many of today's cars include around over two miles (or over 3km) of wiring with more than 100 ECUs.

And all of these features have put increased demands on the data and electric systems. Twenty years ago, the electrical power consumption of an average car was comparable to a hair dryer. Today, the power required is comparable to an entire household. In past years, cars transferred 15,000 pieces of data in a second versus processing 100,000 pieces of data in 2020. A car's data speed used to be approximately 150 kilobits per second. It's now chugging along at gigabytes per second. And we haven't even come close to what will be required for the fully autonomous vehicles of the future.

SMART ARCHITECTURE: THE NEED TO REIMAGINE

Aptiv began with an initial principle: Level Four and Level Five autonomous vehicles will experience an architectural break; therefore, the design and manufacturing processes must be reimagined. However, what we didn't realize at the outset was that many of our customers were already having architectural issues… in nonautonomous vehicles.

The reason? Manufacturers have completely changed what a car can do — without really revolutionizing *the way it's made*. The modular way in which features have typically been added to a vehicle has led to an inflexible and unaffordable manufacturing process. As advanced driver assist systems evolve from semi-autonomous to fully autonomous, a similar evolution must happen on the assembly line.

Thus, Smart Vehicle Architecture was born.

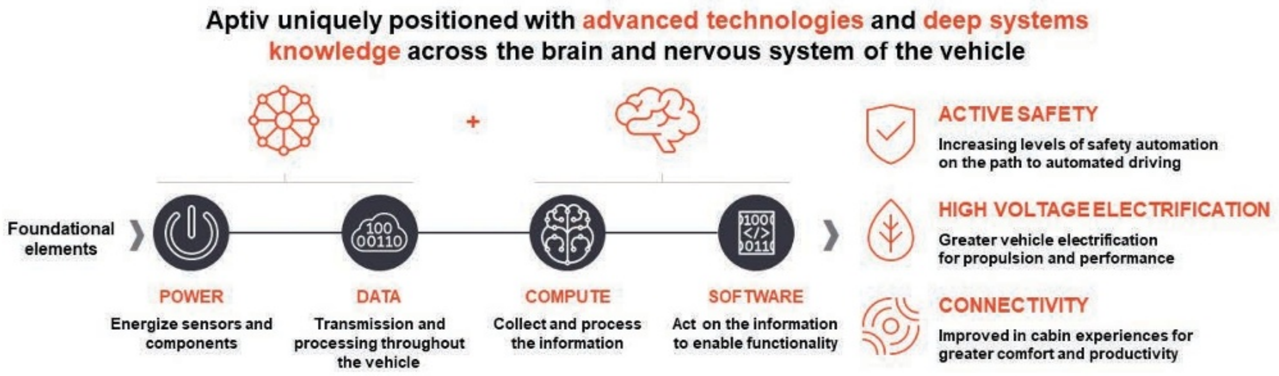
Smart Vehicle Architecture (SVA™) is how we describe the future of the car. While there are a variety of ingredients that make up a car's architectural ecosystem — electric, active safety, automation and connectivity systems to name a few — we envisioned SVA as a unified backbone that consists of three critical systems: compute, network and power. And if you follow the systems and circuitry from sensor to cloud — that's essentially Smart Vehicle Architecture.

SVA reimagines the way we architect a car, creating the foundation for the software-defined vehicle of the future, while also enabling the flexibility that our customers value. We create customized architectural solutions that speak to the unique parameters of the problem. What's important is that we're making the best decisions around architecture to exceed expectations when it comes to flexibility and safety.

INSPIRATION FOR INNOVATION

When ideating and improving upon SVA, we find inspiration everywhere — and sometimes we don't have to look much further than our own pockets. Smartphones can update their own software over the air and have the capability of downloading apps that can add functionality and flexibility. Traditionally, cars are manufactured and sold as a monolith composed of embedded software and hardware, making it difficult to improve upon individual features. SVA solves for this problem by allowing for different lifecycles of the hardware and software components by treating them as individual systems. By separating them in this manner, we are now able to develop the vehicle's hardware while at the same time creating a flexible software framework with tailor-made computing, data and power distribution networks to support it.

This means that drivers will be able to add more functionality and more content to the vehicle without having to upgrade costly hardware. In the future, you will be able to download updates to your software without taking it into the shop — just like a smartphone.



Aptiv uniquely positioned with advanced technologies and deep systems knowledge across the brain and nervous system of the vehicle

Foundational elements

POWER
Energize sensors and components

DATA
Transmission and processing throughout the vehicle

COMPUTE
Collect and process the information

SOFTWARE
Act on the information to enable functionality

ACTIVE SAFETY
Increasing levels of safety automation on the path to automated driving

HIGH VOLTAGE ELECTRIFICATION
Greater vehicle electrification for propulsion and performance

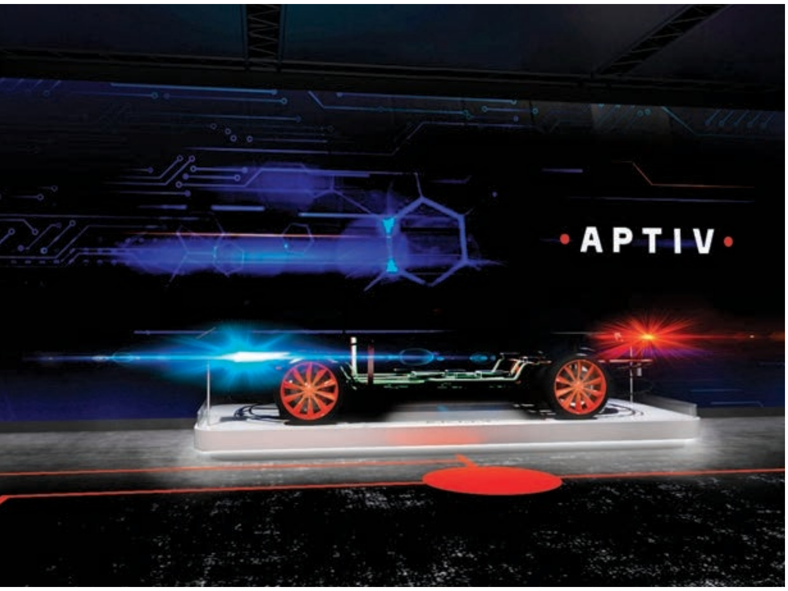
CONNECTIVITY
Improved in cabin experiences for greater comfort and productivity

SAFETY FIRST

It should come as no surprise to read this: cars should be safe. And for years, cars have been designed with safety first. But what happens to safety when cars themselves are reinvented?

While we were reimagining ways to create vehicle architecture, we were simultaneously reimagining the safety systems that would keep drivers safe should one of the architectural components malfunction or fail. Our team developed a three-layer, fail-operational design which embeds resilience in all three layers (compute, network, power). This embedded resilience means that, in the face of a partial or total breakdown of a system, the vehicle is still able to come to a safe stop.

In order to develop this holistic, fail-operational design, we had to continually ask ourselves questions about all three layers to ensure we had solutions for each.



- **COMPUTE:** What happens in a critical computer failure? We quickly realized we couldn't depend on a centralized compute node, so we incorporate enough redundant compute power into the architecture to bring the vehicle to a safe stop.

- **NETWORK:** What happens if there is a failure in the network connectivity within the vehicle? Knowing that the architectural real estate is already limited, we knew we couldn't create an entire redundant network, so we innovated a dual ring topology system. SVA's ring topology is the intersection of flexibility and affordability, where each node connects to two other nodes, forming a continuous pathway — a ring — for signals to travel through each node. This approach is highly efficient and handles heavier loads better than traditional star topology, allowing us to achieve the redundancy we need in an affordable way.

- **POWER:** Can we rely on only one power source as cars have traditionally done? This was the quickest "no" in recent memory. Our Smart Vehicle Architecture solutions include smart, dual ring power supplies with smart fusing, allowing us to affordably deliver fail-operational performance.

Safety is the first thing we think about when we wake up, the last thing we think about before we go to bed — and everything in between. We're passionate about making the future of mobility work, safely. And the foundation to making this new world of mobility real begins with Smart Vehicle Architecture.

LEE BAUER, VICE PRESIDENT OF MOBILITY ARCHITECTURE, APTIV

APTIV

THE CROSS SECTION OF MUSIC AND TECH

BLOCKCHAIN & HIP HOP

By Marcel "The Messenger" Jeremiah and Mike Johns

Blockchain technology is starting to impact the mainstream space. From the potential of a blockchain-based currency for Facebook to Microsoft announcing a platform that will provide proof of authenticity for luxury goods, the digital ledger is demanding space in every industry. Recently PUSH Tech 2020 Summit, hosted by Reverend Jesse Jackson and Pastor Joseph Bryant Jr. took place at the Salesforce headquarters to discuss and celebrate diversity in tech's most exclusive bubble, Silicon Valley.

Seeing Jackson's name alongside a tech event might puzzle some, but the civil rights leader is using his platform to push the presence of more underrepresented groups in the tech industry. Tech devices and applications are used by all, so the industry is looking to empower a range of voices and backgrounds. Jackson also acknowledged the potential of blockchain technology as he listened to Tech This Out's "Blockchain & Hip Hop" panel, which showcased how blockchain will impact the artists that dominate culture on and off the charts.

Blockchain technology gives users the power to control their business transactions and agreements without the need of costly (and sometimes invasive) third parties. The concept will continue to spread and will help bring more black voices into the tech industry. The blockchain panel included Bay Area artist B-Legit and Grammy nominated producer/songwriter Vincent Berry II, giving an insider's look into how blockchain will impact the industry.

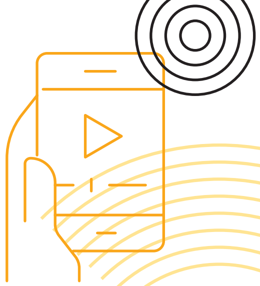
With a surge in cryptocurrency awareness and popularity over the last two years, new artists are embracing blockchain's fast, transparent and secure system to bypass the gatekeepers of the music industry. Hip hop has always been an early adopter to technology as artists became entrepreneurs, pushing music to exist beyond hit singles and become their financial asset. When you hear Berry mention blockchain and Beyonce in the same breath, it's easy to see why blockchain is buzzing around the right circles. In time, more artists will master blockchain the same way they mastered using social media and streaming platforms to drive their careers.

Everyone from rappers to Rev. Jesse Jackson (center) are embracing blockchain.

TECH AT CES

Ray J has embraced technology with successful ventures including his Scoot-E-Bike company, wireless earphones line and now blockchain technology for his music — his soon-to-be released third album will be powered by blockchain. The little brother to platinum-selling recording artist Brandy Norwood and cousin to Snoop Dogg, singer, businessman and tech entrepreneur Ray J sold his Scoot-E-Bike business to Canadian company LOOPShare. Scoot-E-Bikes is hitting the streets in 2020, with digital dashboard services and tech unlike any bike-sharing company on the market. The electric scooter (e-scooter) is one of the fastest growing urban mobility phenomena. A study by the Boston Consulting Group (BCG) estimates the global e-scooter market will reach up to $50 billion by 2025, with roughly 50% of usage stemming from the U.S., followed by Europe.

Ray J is the recipient of the Tech This Out Nipsey Hussle Innovation Award that recognizes those representing underserved markets who are at the forefront of innovation and change. "Nipsey was a trailblazer. Those are big shoes to fill but I'm honored to be recognized," said Ray J. "Giving a shine on diversity and inclusion is big," he added. ■



FUBU: THE FUTURE OF MUSIC RADIO

By Mike Johns

FUBU, the brand founded by Daymond John, J. Alexander Martin, Keith Perrin and Carlton Brown, started as a hat company based out of Hollis, Queens, New York. FUBU (For Us By Us) became a fashion staple during the 1990s streetwear scene. By the early 2000s, the brand had permeated the global mainstream. Although the company pulled out of U.S. markets, FUBU has managed to stay afloat thanks to international licenses in China, Japan, Korea, Saudi Arabia and South Africa.

Now enter FUBU Radio, the new name in urban radio. Launched in 2015, the online radio platform offers hip hop, R&B and "infotainment" news content. Keith Perrin, co-founder of FUBU and president of FUBU Radio, is a man on a mission. Having launched FUBU Radio, the brand has secured major distribution deals with iHeartRadio and radio powerhouse Entercom. Gen Z music fans have embraced the digital format and prefer the increased interactivity and personalization of digital services like Pandora and Spotify. Luckily, from its mobile app to distribution partnerships, FUBU is accessible at any time. Today's listeners have access to unlimited choices for audio in podcasts and music, and FUBU Radio meets listeners' demand.

I had the privilege to sit down with Keith Perrin to discuss FUBU Radio, radio's changing role in the American musical diet, and the sources and effects of that change — on music, on radio and on us.

Top: Celebrating FUBU, the new name in urban radio.
Bottom: FUBU Radio Co-founder Keith Perrin

What is the 'why?' behind FUBU Radio?

FUBU as a brand has always been more about the culture and not just clothing. We felt it was more of a movement and we decided to expand the brand by branching off to different mediums. We felt that this platform would be a way to put out music and programming that benefited our culture but also educated in ways that terrestrial radio didn't. We now have a say in what issues affect our culture and can address them how we feel they need to be addressed.

What separates FUBU Radio from other brands such as Apple, Spotify or Deezer?

FUBU Radio is a 24-hour terrestrial format radio station that streams online. FUBU RADIO has DJs and on-air personalities that listeners can relate to and interact with on air, on social media and in person. Apple, Spotify and Deezer are streaming companies that house playlists, their audiences built out of frustration of hearing the same songs or not hearing a song they used to enjoy on their local radio station. Our business model is not the same.

How has hip hop changed since FUBU's inception?

Hip hop has changed dramatically since we formed FUBU back in 1992. Back then the record labels groomed their artists by providing an A&R to help the artists put out the best product. Social media also wasn't available, so you had to get out and touch the people in many ways. Now artists are required to have high social media numbers before they are even given a chance to sign with a major record label. 360 deals were also unheard of back then and artists were knocking down the record labels' doors to get a deal. These days an artist would rather go independent than give the labels full control of their brand and finances.

Has terrestrial radio changed?

Yes. They have enhanced their brands by adopting streaming as a platform to stay connected to their audience outside of the car. What hasn't changed is their programming. Terrestrial programmers still have no control over what they program and some are still stuck in the past when it comes to programming.

What does the future hold for FUBU?

We have a brand that is known and respected worldwide. We are building an empire that includes hotels, TV, radio, mobile stores and clothing. We have just signed deals in Africa, Europe and have major retail launches in 2020. ■

OPINION

OWN YOUR DATA

By Lauren Bissell

Today, I believe the biggest problem in the music industry is a shrinking financial pie. This affects all aspects of the industry — artists, labels, studios, distributors, managers and agents. When an industry is under distress, companies look for new revenue streams. Big data is that revenue stream.

The application of data analytics in the music industry has given us lots of useful tools. It allows artists to determine which markets are the most profitable so they can spend marketing and touring budgets wisely. It allows consumers and fans simple and convenient luxuries like tailored playlists or better music recommendations. All of these use cases deliver real value and pose little threat.

The area that brings us into the danger zone is the sale of big data sets. Distribution companies like Spotify, Pandora, Netflix and Apple for example are dependent on data-driven models. Sure, they distribute music as their public facing service, but behind the scenes they're essentially in the business of selling information as a monetizable asset. Fans essentially are the product.

Consumers seemed fine with this initially, until these data sets were used for more than just regular ad targeting. When data was leveraged for political campaigns without consumers' knowledge, people woke up.

Data analytics is fairly new, and when disruptive new technologies take hold, it's normal for ethics practices and legislation surrounding that technology to swing like a pendulum that hopefully lands in the middle.

But there's two major problems that must be solved before that pendulum can rest. First, fans and consumers are angry. They've woken up to the fact that their data is being used without their knowledge. The average American has given up a minimum of 5,000 data points (aka their personal information) to corporations without knowing it. We have to engage in the right kind of discourse and come to a consensus on what's ethical. That will be turned into new laws and legislation.

IMMUTABLE Music Founder Lauren Bissell

Second (and this will hurt the entertainment industry), data-driven companies have to adjust their business models to handle the changes that are coming. Data is keeping the lights on. Unfortunately, most of these companies have taken advantage of the "Wild West" nature of data laws, especially in the U.S. When the legal structure (or lack thereof) changes abruptly, they will lose a revenue stream that was keeping them afloat.

Privacy laws vary by country, with the U.S. being one of the most relaxed in regard to data compared to Europe, but that's changing quickly. Companies here face the potential to suffer the most as their business models depend on soon-to-be outdated legislation. Already, consumers can decline the tracking of their data when they visit a website, and still use the website. Mobile apps and social media platforms will soon be required to provide easier methods of controlling data collection.

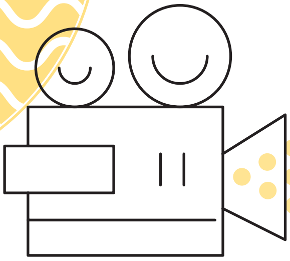
WHAT'S NEXT?

The future status of data is very similar to that of intellectual property (IP). Data is an asset. Companies may be collecting it, but consumers are the source and will soon own their own data, legally.

IP is licensed. Real estate is leased. Data could soon fall into an existing asset class or become its own, and the renters of that asset will have to pay for it. Studies prove that users are more likely to provide more data if they know what it's being used for and that equals more profits. If that profit is shared, the model will not only survive, it will thrive.

If the music industry finds a way to reward consumers for the money-making data they provide, they will set themselves up for a sustainable future. ■

Lauren Bissell is the Founder of Immutable Music.



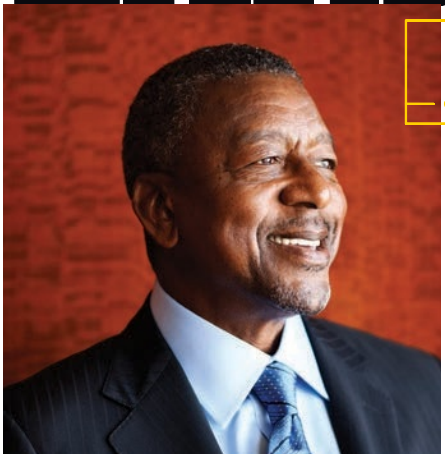
BET'S BOB JOHNSON SPEAKSOUT

By Marcel "The Messenger" Jeremiah

From watching *106 & Park* every day after school, witnessing the special musical moments of the BET Awards or even catching reruns of *The Parkers*, BET was the first media that I consumed that unapologetically captured black culture. Black Entertainment Television launched as a 24-hour TV channel in 1983, giving people of color a space to learn, be entertained and be represented. Black viewers finally had a channel that fully represented them. Now, BET Founder Bob Johnson wants to bring that representation to a new generation.

I recently spoke with Johnson about the future of his video on demand (VOD) venture and the importance of bringing technology and content together for new audiences. When companies realize there's a demand for content in specific demographics and they supply consumers with what they want to see, the outcome is a concept like BET. Over the past few years there's been a resurgence of black leading characters on primetime television. It's not an accident, either. TV showrunner Shonda Rhimes has the power to create whatever she wants because of her successful shows like *Scandal*, *Grey's Anatomy* and *How To Get Away With Murder*, which have a diverse cast, people of color in leading roles and original storytelling.

"Technology gives you an emotionally engaging experience of voices, words, stories and music — things that make you feel a certain emotion," Johnson says. As television, the internet and now augmented reality devices come into play, experiences become immersive and the content has to be stronger than ever. Johnson is utilizing the importance of creating and highlighting solid content when it comes to his streaming service RLJ Entertainment, which was acquired by AMC Networks for roughly $274 million, according to the companies.



BET Founder Bob Johnson

Melissa Golden/Redux

RLJ serves two distinct audiences with Acorn TV (British TV) and UMC (Urban Movie Channel). Understanding the necessity for diversity in media, he hopes to continue creating opportunities for talented black creators. During the interview, Johnson also gave a nod to the guilty pleasures of the internet like Worldstar Hip Hop, Diamond and Silk's YouTube channel, and The Shade Room. No matter how you feel about celebrity gossip and viral videos, he says, they're a huge market.

"Cable television is the transmission of other people's content," Johnson claimed, and content rules everything around us. We're bombarded by advertisements when we watch videos on YouTube or listen to the radio. Marketers are becoming more invested in content marketing to influence consumers who have gotten savvy with their ad blocking features but are willing to read articles and watch videos that have value to them. But at the end of the day there is no audience without content that speaks to them. Johnson has built a career highlighting stories for a segment of the population that doesn't always get deemed worthy in the mainstream audience's eyes. As we progress as a society those gatekeepers are slowly opening the doors.

One tool that wasn't properly highlighted is blockchain technology. With the ability to secure transactions digitally, content marketers and writers can connect with publishers directly and determine the value of their work without the traditional system. Johnson believes the internet is bringing control to consumers and how people should not be afraid of free expression of ideas and blockchain technology will help bring that element of freedom to creators.

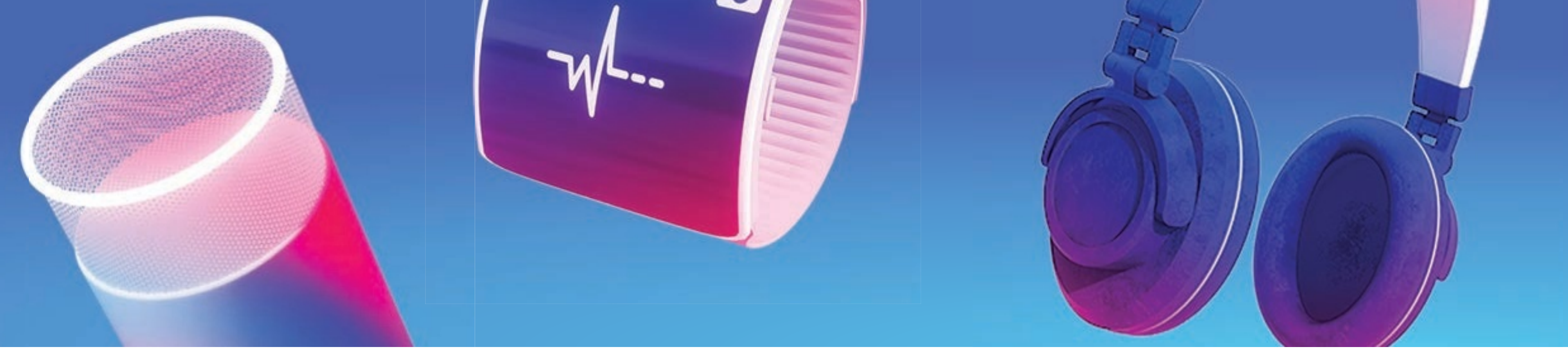
Technology is advancing quickly, and content creators need to advance alongside it. ■

CES Unveiled

LAS VEGAS | Jan. 5, 2020 | 5-8:30 PM

The official media event of CES – CES Unveiled Las Vegas, welcomes more than 1,200 press and industry analysts who come to see the latest products and technologies two days before CES officially opens. Over 200 tech companies are showcasing their innovations ranging from virtual reality, smart homes, robotics, automotive, NEXT GEN TV and much more. Below find booth numbers and websites for exhibitors and find the most up to date listing on-site.

EXHIBITOR	BOOTH #	WEBSITE
Abbott	504	abbott.com
Access Explorer	EP-814	accessexplorer.net
ADOK	EP-723	getadok.com
Aeronext Inc.	221	aeronext.com
Aitheon	EP-725	aitheon.com
Alarm.Com Inc.orporated	318	alarm.com
All You Need Is	EP-736	allyouneedis.co.jp
Anova	429	anovaculinary.com
Arom R SARL	EP-131	arom-air.com
Atmosic Technologies	528	atmosic.com
AURA Devices	EP-809	auraband.io
Baby Brezza	118	babybrezza.com
Baracoda Group	622	baracoda.com/en
Bartesian	344	bartesian.com
Beijing Magical Picture Technologies Ltd.	EP-700	wonderpainter.net
Binah.ai	331	binah.ai
BluArmor	EP-621	thebluarmor.com
BookINOU by Pimely SAS	EP-143	mybookinou.com
ByStamp	EP-717	bystamp.com
Caregiver Smart Solutions	EP-238	caregiversmartsolutions.com
CarePredict	537	carepredict.com
Cepton Technologies Inc.	431	ceptontech.com
Charmcare Co. Ltd.	237	h2care.com
Chronolife	EP-754	chronolife.net
Cleer Inc.	503	cleeraudio.com
ClimateSeed	EP-719	climateseed.com
COLEEN	EP-813	coleen-france.com
COMPOZ	EP-240	artiris-parfum.com
Core	EP-706	hellocore.com
Cosmo Connected	328	cosmoconnected.com
Crypto Watches Corp.	EP-135	cryptowatches.com
Danby Appliances	637	danby.com
Dell Inc.	430	dell.com
deScammer	EP-137	descammer.com
D-Link Systems	532	us.dlink.com
DnaNudge	305	dnanudge.com
Duolab	EP-707	duolab.com
Elios	EP-828	myelios.com
EnvisionBody	EP-812	envisionbody.com
Fasetto Inc.	643	fasetto.com
FindOut	EP-236	findout.fr
FLOVEA	EP-810	flowboxinteractive.com
FPV Robotics Inc.	116	fpvrobotics.comenterprise-2019
Gatebox Inc.	625	gatebox.ai
Gentex Corp..	642	gentex.com
glafit Inc.	531	glafit.jp
Goyalab	EP-718	goyalab.com
GROOVE X Inc.	EP-712	groove-x.com/en/
Guangzhou Puppy Robot Technology Co. Ltd.	215	puppyrobot.com
HAMPTON Products International	333	benjilock.com
HAP2U	535	hap2u.net
Hatch Inc.	338	hatch.co
Healbe Corp..	341	healbe.com
HeartHero	EP-611	hearthero.com
Home Skinovations Ltd.	110	toothwave.com
Icon.AI	EP-603	icon.ai
Idein Inc.	632	idein.jp
IEVA	345	ieva.io
igloohome	336	igloohome.co
iKuddle Inc.	640	ikuddle.com
Immoshoot	EP-607	site.immoshoot.com
InBody Co. Ltd.	633	inbody.com
Industrial Technology Research Institute	529	itri.org.yw/eng/
InteraXon Inc.	342	choosemuse.com
IoTeX	EP-710	iotex.io
IoThink Solutions	EP-721	iothink-solutions.com
J5Create	239	j5create.com
Jabra	606	jabra.com
Johnson & Johnson	645	jnj.com
Kazoo LLC	EP-230	getkazoo.com
Kingston Technology Company Inc.	320	kingston.com/us
Klaxoon	521	klaxoon.com
Kohler Company	434	kohler.com
Koito & NAL	443	nal.com
Kromtech Alliance Corp.	439	kromtech.com
LeddarTech	441	leddartech.com
Legrand	505	legrand.com
Legrand	507	legrand.com
Lexilife	EP-228	lexilife.com
LG Electronics	303	lg.com/us
LiBEST	EP-744	libest.co
LimaTech	EP-803	limatech-france.com
Living In Digital Times	543	livingindigitaltimes.com
Living In Digital Times	545	livingindigitaltimes.com
LivingPackets SAS	EP-746	livingpackets.com
L'Oreal	332	lorealusa.com
lululab	506	lulu-lab.com
Lumi by Pampers	324	lumibypampers.com
Lutron Electronics Co. Inc.	523	lutron.com
Maison Berger Paris	EP-816	maison-berger.com
Mateo	EP-703	mateo.ai
MAXPRO Fitness	EP-823	maxfitpro.com
MicroEJ	540	microej.com



EXHIBITOR	BOOTH #	WEBSITE
Moen Inc.	306	moen.com
mui Lab Inc.	335	mui.jp
Mutrics Innovation Technology Co. Ltd.	EP-609	mutrics.com
My Cyber Royaume	EP-745	mycyberroyaume.com
MyFit Solutions	EP-145	myfit-solutions.com
mysofie	EP-722	mysofie.fr
Mystic Pants	EP-244	mysticpants.com
Nanoleaf	517	nanoleaf.me
NEMEIO	EP-737	nemeio.com
NEOFECT	542	neofect.com
NEOFECT	544	neofect.com
NEXR Technologies SE	229	nexr-technologies.com
NextMind	534	next-mind.com
NovaSight	EP-129	nova-sight.com
Nuheara	402	nuheara.com
Nutricco	EP-701	nutricco.com
ohSnap Inc.	EP-738	ohsnap.com
Olive Union	526	olive.store
Olythe	EP-242	olythe.io
Omron Healthcare Inc.	536	omronhealthcare.com
OneLife GmbH	EP-822	onelife.co
Opte Skin	508	opteskin.com
Oral-B iO by Procter & Gamble	322	oralb.com
ORBI Inc.	404	orbiprime.com
Otonohm	EP-730	otonohm.com
OWC	304	owc.com
Owl Labs	EP-232	owllabs.com
OxiCool Inc.	403	oxicool.com
Oxytap Pte Ltd	EP-747	oxytap.com
PantryOn	EP-141	macfaucets.com
PassiveBolt Inc.	EP-821	sheperdlock.com
PlayShifu	334	playshifu.com
Pokit Innovations	EP-749	pokitmeter.com
Pollen Robotics	EP-709	pollen-robotics.com
POSQA	EP-825	posqa.co
POW Audio	530	powaudio.com
Powervision Robot Corp.	405	powervision.me
PowerWatch	330	matrixindustries.com
Pretika Corp..	406	pretika.com
Private Discuss	EP-801	private-discuss.com
Prof en Poche	EP-743	profenpoche.com
Pundi X	EP-605	pundix.com
Reliefband Technologies	231	reliefband.com
Robosense/Suteng Innovation Technology Co. Ltd.	602	robosense.cn
Rocean	EP-748	rocean.com
Safe-Tec Smart Helmet	432	safetechelmets.com
SAS Protecto	EP-800	protectonnect.com
Sengled	519	us.sengled.com
Sensorscall	EP-702	sensorcall.com
Shenzhen Ling Yi Innovation Technology	630	pitaka.com

EXHIBITOR	BOOTH #	WEBSITE
Shiftall Inc.	631	shiftall.net
Shure Inc.	124	shure.com
SiFive	223	sifive.com
SketchOn	316	prinker.us
Smardii	EP-726	smardii.com
SmartShapes	EP-739	
Somfy Activites SA	122	somfy.com
Sourcenext Inc.	219	sourcenext.com
SpotOn Virtual Smart Fence	442	spotoncollar.com
ST37 Sport et Technologie	EP-752	st37.fr
STAR Labs	407	
Stern Pinball	628	sternpinball.com
Stopskate	EP-750	stopskate.com
Sure Petcare	538	surepetcare.com
SureCall	225	surecall.com
Suunto Oy	203	suunto.com
Suunto Oy	205	suunto.com
TacSense Inc.	EP-724	tacsense.com
Tali Connected	EP-728	taliconnected.com
Targus	433	targus.com/us
TChek	EP-617	tchek.fr
TecPal Ltd.	307	cookingpal.com
TegWay Co Ltd	EP-708	tegway.co
Tenminds	604	10minds.com
Terawatt	EP-601	gpterawatt.com
Tineco Intelligent Technology Co. Ltd.	207	tineco.com
Tink Digital Inc.	EP-720	doodlematic.com
Tivic Health Systems	EP-234	tivichealth.com
TriEye	EP-619	trieye.tech
Trova	EP-246	trovaofficial.com
ULLO	EP-741	ullo-world.fr
URGOTECH	541	urgonight.com
Valerann UK Limited	EP-734	valerann.com
Vinylrecorder.com	638	vinylrecorder.com
VistaKlub	EP-740	vistaklub.com
Wallbox	329	wallbox.com
Watch Skins Corp.	EP-133	watchskins.com
Waverly Labs Inc.	EP-827	waverlylabs.com
Wayzn	502	wayzn.com
Whirlpool Corp..	302	whirlpool.com
Wi-Charge	644	wi-charge.com
willow	409	willowpump.com
Winston Privacy	EP-704	winstonprivacy.com
Withings	314	withings.com
Wizama	EP-711	wizama.com
World Matcha Inc.	539	w-matcha.com
Xenoma	427	xenoma.com
Y-Brush	EP-139	y-brush.com
Yukai Engineering Inc.	623	ux-xu.com
Zero Mass Water	217	zeromasswater.com
Zibrio Inc.	EP-804	zibrio.com

As of Nov. 25, 2019

CES® 2020
INNOVATION AWARDS

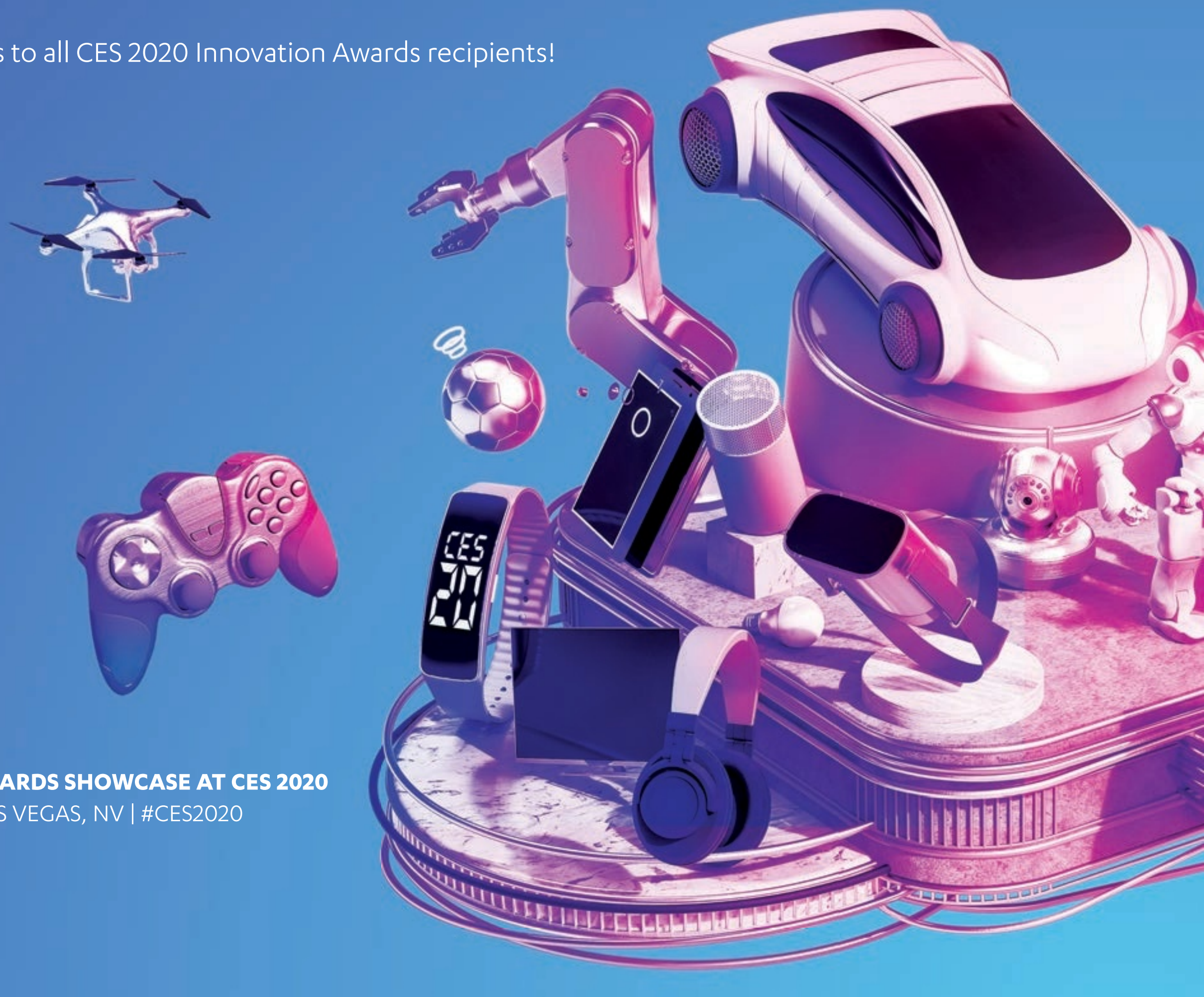
The CES 2020 Innovation Awards program is an annual competition honoring outstanding design and engineering in consumer technology products. Since 1976, this respected program has celebrated and recognized the ground-breaking technologies of the future.

The program spans across 28 product categories and recognizes the most influential and inventive fields in the industry, from embedded technologies to smart home to virtual and augmented reality. Entries are reviewed by an elite panel of industry expert judges comprised of members of the media, designers, engineers and other industry experts to evaluate products on engineering qualities, aesthetic and design functionality, as well as consumer appeal.

Products selected as Innovation Honorees reflect the pioneering ingenuity driving our industry. The prestigious Best of Innovation designation goes to the top-scoring products.

Many winning products will be featured at CES 2020 in the Innovation Awards Showcase located in the Venetian Ballroom at the Sands/Venetian. **Visit CES.tech/Innovation** for more information and to see the full list of honorees.

Congratulations to all CES 2020 Innovation Awards recipients!



INNOVATION AWARDS SHOWCASE AT CES 2020
JANUARY 7-10 | LAS VEGAS, NV | #CES2020

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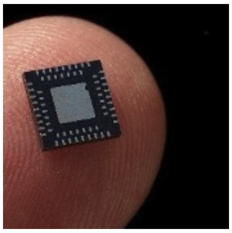
2020
BEST OF INNOVATION AWARD HONOREES

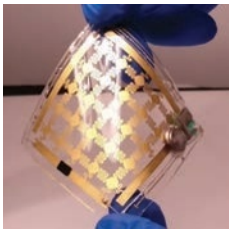
3D Semantic Camera
Outsight
Category: Smart Cities

All New Sleep Number Climate360® Smart bed
Sleep Number
Category: Smart Home



Atmosic M3 Battery-Free Bluetooth 5 SoC
Atmosic Technologies
Category: Embedded Technologies

Avast Omni
Avast
Category: Cybersecurity & Personal Privacy



Bluefin
mmh Labs
Category: Tech for a Better World

Bosch 3D Display - for automotive applications
Bosch
Category: In-Vehicle Entertainment & Safety

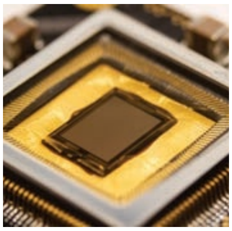
Bosch Virtual Visor
Bosch
Category: Vehicle Intelligence & Transportation

Code Jumper
American Printing House for the Blind
Category: Accessibility

Code Jumper is an educational toy that opens up the world of coding to students who are blind or visually impaired. This innovation allows for inclusive learning and puts students on a path to a meaningful career in computer science.

codejumper.com

Colgate Plaqless™ Pro
Colgate Palmolive
Category: Health & Wellness



DVxplorer
iniVation
Category: Embedded Technologies

H2-BP (Wristband type blood pressure monitor)
Charmcare Co. Ltd.
Category: Wearable Technologies

The world's first wristband type blood pressure monitor, measuring SYS, DIA and pulse rate! It is the cuff type to press only one artery to have a stable signal for accurate measurement. It has been approved as a medical device with the tolerance within +/-5mmhg.

h2care.com

2020 BEST OF INNOVATION AWARD HONOREES

Halo Hypersport
Damon Motorcycles
Category: Vehicle Intelligence & Transportation

Halo Light 10G Fiber WiFi6 Intelligent Home Wi-Fi System
Zyxel Communications Inc.
Category: Computer Peripherals & Accessories

Hydraloop
Hydraloop Systems BV
Category: Sustainability, Eco-Design & Smart Energy

Leica Geosystems BLK2GO
Leica Geosystems
Category: Digital Imaging/Photography

LG SIGNATURE OLED TV RX (Model 65RX)
LG Electronics Inc.
Category: Video Displays

Long Endurance Fuelcell Drone(DS30 with DP30)
Doosan Mobility Innovation
Category: Drones & Unmanned Systems

Meeting Owl Pro
Owl Labs
Category: Robotics

NextMind
NextMind
Category: Virtual & Augmented Reality

Norm Glasses
Human Capable Inc.
Category: Headphones & Personal Audio

NEVER
SETTLE

OnePlus
OnePlus
Category: Mobile Devices & Accessories

OrCam Hear
OrCam Technologies
Category: Accessibility

Planty Cube
nthing
Category: Smart Cities
Planty Cube is a modular vertical farm in a 40-foot container which can grow high quality vegetables year-round in a fully controlled environment. Farms are automatically operated through the 'CUBE OS' with data driven operations. This is a sustainable agriculture solution, introducing a new way for farming and distribution of greens.
nthing.net

2020
BEST OF INNOVATION AWARD HONOREES

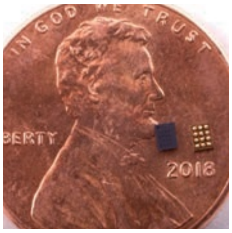
Q800T Soundbar + QLED TV by Samsung
Samsung Electronics America Inc.
Category: Home Audio/Video Components & Accessories

Samsung Galaxy Note10+ 5G
Samsung Electronics, Inc.
Category: Mobile Devices & Accessories

Samsung Sero
Samsung Electronics America, Inc.
Category: Video Displays

Smart Kitchen Cooking Machine
TecPal Ltd.
Category: Home Appliances

St. Noire - an Alexa Hosted Cinematic Board Game
VIRSIX GAMES
Category: Gaming



Syntiant® NDP100™ Neural Decision Processor™
Syntiant Corp.
Category: Embedded Technologies
The Syntiant® NDP100™ microwatt-power Neural Decision Processor™ provides always-on AI processing for voice and other sensor applications in a wide-range of battery-powered devices, from earbuds to laptops.The NDP100 consumes less than 150 microwatts, enabling devices to be roughly 200 times more efficient, and provides 20 times the throughput of the typical low-power MCU solution.
Syntiant.com

The Valerann Smart Roads System
Valerann
Category: Smart Cities

Zen-P VSLAM Deep Learning Module
Bot3, Inc.
Category: Embedded Technologies

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
3D Printing	
da Vinci Color 5D	XYZprinting Inc.
Snapmaker 2.0: Modular 3-in-1 3D Printers	Shenzhen Snapmaker Technologies Co. Ltd.
Tailored Facial Mask Pack 3D Printing System	Amorepacific and Lincsolution
ULTRA Supercharged - 3D Printer	VOLUMIC 3D
Accessibility	
BeHear ACCESS	Alango Technologies Ltd.
e-skin Sleep & Lounge	Xenoma
iLiving V8 Foldable Mobility Scooter	iLiving USA
Neofect Smart Balance	NEOFECT
TACTILE PRO: The world's first tablet PC for the blind	PCT Co. Ltd.
Computer Hardware & Components	
Acer Swift 5	Acer
AMD Ryzen™ Threadripper™ 3990X	Advanced Micro Devices Inc. (AMD)
AVITA ADMIROR*	**AVITA**
Carbon Metal Composites Heatsink and Baseplate	Nano and Advanced Materials Institute Limited
ConceptD 7 Spin Pro	Acer
Dell OptiPlex 7070 Ultra and Height Adjustable Stand*	**Dell Technologies**
Diey	In Win Development Inc.
Elite x2 G4	HP Inc.
GeForce RTX 2080 Ti LIGHTNING 10th Anniversary Edition	MSI Computer
GT76 Titan DT	MSI Computer
HP Elite Dragonfly	HP Inc.
HP Envy 13	HP Inc.
HP Envy All-in-One	HP Inc.
HP SPECTRE X360	HP Inc.
Kano PC	Kano
Klaxoon Teamplayer	Klaxoon
Lenovo Yoga 8 5G	Lenovo
LG gram 17 (17Z90N)	LG Electronics Inc.
MEG Aegis Ti5	MSI Computer
Norm Glasses	**Human Capable Inc.**
Galaxy Book Ion	Samsung Electronics Inc.
Prestige P100	MSI Computer
ProArt StudioBook Pro 15	ASUS
Razer Blade Stealth Gaming Ultrabook w/GTX 1650 graphics	Razer USA Ltd.
ROG Strix SCAR III	ASUS
Samsung 30.72TB PCIe Gen4 NVMe SSD	Samsung Eectronics Inc.
WD_BLACK™ P50 Game Drive SSD	Western Digital
ZenBook 15	ASUS
ZenBook Flip 15	ASUS
ZenBook Pro Duo	ASUS
Galaxy Book Flex	Samsung Electronics Inc.
Computer Peripherals & Accessories	
980 PRO SSD	Samsung Electronics America Inc.
Acer C250i projector	Acer
Arcadeo Gaming Chair	ARCADEO
ASUS ProArt Mini LED 120Hz 4K HDR Professional Monitor	ASUS
Deco AX6600 Whole Home Mesh Wi-Fi System (Deco X90)	TP-Link
Jabra Panacast 180° Panoramic-4K video solution	Jabra
Kandao Meeting 360° All-in-one Conferencing Camera	KanDao Technology Co.,Ltd & InFocus Corp.
LG 31.5-inch 4K HDR IPS monitor 'UltraFine Ergo'	LG Electronics Inc.
LG UltraGear™ Gaming Monitor (Model 27GN950)	LG Electronics Inc.
LG UltraWide™ Monitor (Model 38WN95C)	LG Electronics Inc.
Logitech MX Master 3 Advanced Wireless Mouse	Logitech
Meeting Owl Pro	Owl Labs
MiraLogic Workspace Management System	Targus

Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
Nighthawk AX8 8-Stream WiFi 6 DOCSIS 3.1 Cable Modem Router	NETGEAR Inc
Optix MAG161	MSI Computer
Optix MEG381CQR	MSI Computer
Portable SSD T7 Touch	Samsung Electronics America Inc.
ProPoint	Swiftpoint
ROG STRIX ARION	ASUS
ROG Z11 Gaming Case	ASUS
Samsung CTG9 49" Monitor	Samsung Electronics America Inc.
Smart Swim	Vuzix Corp.
tori™ Explorer Pack	BANDAI NAMCO Entertainment America
USB-C™ Quad Video 4K (QV4K) Universal Docking Station	Targus
VIRTUOSO RGB Wireless SE High-Fidelity Gaming Headset	Corsair Components Inc.
Yeti X USB Microphone	Blue Microphones

Cybersecurity & Personal Privacy

Product Name	Company Name
AT.Wallet	AuthenTrend Technology Inc.
DigiSAFE PhoneCrypt D200*	**ST Electronics Info-Security**
Firedome Endpoint Protection	Firedome
KEYMO, the BYSTAMP's revolutionary electronic stamp.	BYSTAMP
Mudi, a portable 4G LTE privacy router for road warriors	GL Technologies (Hong Kong) Limited
Ucam by IoTeX - Private Home Security Camera	IoTeX
Winston	Winston Privacy

Digital Imaging/Photography

Product Name	Company Name
Creator 17	MSI Computer
Dell UltraSharp 27 4K PremierColor Monitor UP2720Q *	**Dell Technologies**
Insta360 GO	Insta360
Insta360 Titan	Insta360
Leica BLK247	Leica Geosystems
LG 88-inch OLED 8K TV (Model OLED88ZX)	LG Electronics Inc.
LitraStudio	Litra LLC.
NIKKOR Z 14-30mm f/4 S Lens	Nikon
NIKKOR Z 24-70mm f/2.8 S Lens	Nikon
NIKKOR Z 85mm f/1.8 S Lens	Nikon
Norm Glasses	**Human Capable Inc.**
Prestige 15	MSI Computer

Drones & Unmanned Systems

Product Name	Company Name
GUSS Autonomous Orchard Sprayer	GUSS Automation
INTHEKEG	INTHEKEG Inc.
Sublue™ Mix Pro	SUBLUE UNDERWATER AI CO. Ltd.

Embedded Technologies

Product Name	Company Name
AerNos AerSIP	AerNos
ChipBuilder	zGlue
Core ScanWatch	Withings
Hailo-8	Hailo
Next Generation Quantum Processor 8K	Samsung Electronics America Inc.
Norm Glasses	**Human Capable Inc.**
Object Tracking Audio	Samsung Electronics America Inc.
Talaria TWO Low Power Wireless Semiconductor Platform	InnoPhase Incorporated
TriEye's SWIR CMOS-based photosensor	TriEye

Fitness & Sports

Product Name	Company Name
BotBoxer Play	SkyTechSport
Core ScanWatch	Withings
CyclePath	**Cyclepath2life.com**
Galaxy Watch Active2	Samsung Electronics Inc.
Galerdo Beker Pro	HAPPY ISLAND TECH CO.,LTD
Higatrec	All You Need Is Inc.
MAXPRO	MAXPRO Fitness
Norm Glasses	**Human Capable Inc.**
The aboutGolf Experience Platform	aboutGolf
YogiFi: An Intelligent Yoga Mat with Immersive Experience	WELLNESYS

Product descriptions begin on page 64.

2020
INNOVATION AWARD HONOREES

Gaming

Product Name	Company Name
85" Q80T	Samsung Electronics America Inc.
Alienware Aurora R9	Alienware
Alienware m15	Alienware
Arcadeo Gaming Chair	ARCADEO
Galaxy Fold	Samsung Electronics Inc.
LG 86-inch LCD 4K TV (Model 86NANO85)	LG Electronics Inc.
Logitech G Adaptive Gaming Kit	Logitech G
MEG Aegis Ti5	MSI Computer
Razer Blade 15 Advanced laptop & Raptor X USB-C Monitor	Razer USA Ltd.
Samsung CTG7 Monitor	Samsung Electronics America Inc.
Samsung Galaxy S10 5G	Samsung Electronics Inc.
tori™ Explorer Pack	BANDAI NAMCO Entertainment America
WD_BLACK™ P50 Game Drive SSD	Western Digital

Headphones & Personal Audio

Product Name	Company Name
Aftershokz Xtrainerz*	**Aftershokz**
ANC True Wireless In-Ear Headphones*	**1MORE**
Ausounds AU-Flex ANC Earphones	Ausounds
Ausounds AU-Stream ANC Earphones	Ausounds
BassMe	Studio Duroy
ClearDryve 180 2-in-1 Headphones	Rand McNally
Dear - Safe Listening for Kids	Linkface
Dual Driver ANC Pro Wireless Headphones*	**1MORE**
EarFun Air Smart True Wireless Earbuds	EarFun, Inc
EarFun Free Fully Waterproof True Wireless Earbuds	EarFun Inc
HELM AMP Cable For Mobile Powered by THX AAA™	HELM Audio LLC.
HELM Audio Mobile MQA / DAC Adapter	HELM Audio LLC.
HELM Electrostatic True Wireless Headphones	HELM Audio LLC.
HELM Triple Driver True Wireless	HELM Audio LLC.
MiniX	Sabinetek - Beijing Sabine Technologies Ltd.
Mobius 5G: Immersive Conversation	MIGU Co. Ltd.
MW65 Active Noise-Cancelling Wireless Headphones	Master & Dynamic
React True Wireless*	**1MORE**
Rider+ Bone Conduction Headphone	Partron Co. Ltd.
SmartMike+	Sabinetek - Beijing Sabine Technologies. Ltd.
Sony WF-1000XM3 Wireless Noise-Canceling Headphones	Sony Electronics Inc.
Una Expandable Floatable Portable Speaker	**POW Audio**

Health & Wellness

Product Name	Company Name
Opte™ Precision Skincare System	P&G
4moms® mamaRoo sleep™ bassinet	4moms
AerBetic Non-Invasive Wearable Diabetes Alert Device	AerBetic Inc.
AI Beauty & Lifestyle Assistant, LUMINI Home	lululab Inc.
All New Sleep Number 360® Smart bed	Sleep Number
All New Sleep Number Climate360® Smart bed	**Sleep Number**
Bello: Lose Belly Fat & Manage your Daily Health	Olive Healthcare Inc.
Butterfly iQ Vet	Butterfly Network
CareAlert	Sensorscall
Carebidet	Curaco Inc.
CAREMITOU	NOVANDSAT
ClearUP Sinus Pain Relief*	**Tivic Health Systems Inc.**
COMORAL®(Oral Irrigation Unit)	SMDsolution Co Ltd.
Core Meditation Trainer	Core
Cubii Go Compact Elliptical	Fitness Cubed Inc.

**Product descriptions begin on page 64.*

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
CUZEN MATCHA – for everyday sustainable energy	World Matcha Inc.
exoRehab	EXOSYSTEMS Inc.
FootWARE	TacSense Inc.
Galaxy Watch Active2	Samsung Electronics Inc.
InBody 970	InBody Co. Ltd.
IQbuds2 Max	Nuheara
Kytera Companion - Smart Remote Caregiver for Aging at Home	Kytera
Lexilens : the dyslexics reading aid eyewear	ABEYE
LUFT Cube, A Portable, Filterless Air Purifier	Rice Ear Inc.
Mateo smart bath mat	Mateo
MedWand	MedWand Solutions Inc.
Motion Pillow 2	Tenminds Co.,Ltd.
Nanit Complete Baby Monitoring System	Nanit
Norm Glasses	**Human Capable Inc.**
OCIGO	Olythe
Olive SmartEar X: Next-Gen Hearing Solution For Everyone	Olive Union
Omron Complete	Omron Healthcare
Oral-B iO*	**Procter & Gamble**
Oticon Xceed	Oticon Inc.
Pragrant, Electric Deodorant	Hanyang University
Pria by BLACK+DECKER*	**Stanley Healthcare**
puripot airFrame: Wall-mountable Air Purifier	Dadam Micro Inc.
Skiin Connected Health & Wellness System	Myant Inc.
SmartyPans	SmartyPans Inc.
TADs	Taiwan user-friendly sensor & tech
Venu™	Garmin Ltd.
Video-based AI-powered Digital Healthcare App	Binah.ai
W Cold and Hot Water Purifier Brain	Bodyfriend Inc.

Product Name	Company Name
xRblood	xRapid France
Zibrio SmartScale	Zibrio Inc. and Pivot International Inc.

High Performance Home Audio/Video

Product Name	Company Name
Crescent	Cleer Inc
JBL SDP-55 Immersive Surround Sound Processor	JBL Synthesis
Mark Levinson No. 5101	HARMAN
Polk Audio Legend Series L800 Tower Speaker	Polk Audio
SVS SB-3000 Subwoofer	SVS
ViewSonic X1000-4K LED Home Theater Projector	ViewSonic Corp.

Home Appliances

Product Name	Company Name
24" IoT Microwave Drawer	Sharp Home Electronics of America
A&S Cordless Automatic Hair Curler	A&S Distribution Sdn Bhd
Albi Home M*	**Albicchiere - beexlab**
All in one JIK.SOO Ice & Water Purifier	SK Magic
Bartesian*	**Bartesian**
Coway Home Care Dress Care System FAD-01S	Coway Co. Ltd.
DUO Carafe	Heatworks
HomeCool*	**OxiCool Inc**
INTHEKEG	INTHEKEG Inc.
KEEP Smart Storage	KEEP Labs Inc.
LG InstaView™ Door-in-Door® Refrigerator with Craft Ice™	LG Electronics Inc.
LG PuriCare™ Mini Portable Air Purifier	LG Electronics Inc
LG Styler with Black-Tinted Mirror	LG Electronics Inc.
LG TurboWash 360 Front-Load Washer and Dryer Pair with AI	LG Electronics Inc.
Narwal world first self-cleaning robot mop & vacuum*	**Yunjing Intelligence Technology(Dongguan)Co. Ltd**
New Laser Sensor for Bacteria Detection	THE.WAVE.TALK

Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
PepsiCo Hydration Platform	PepsiCo
Samsung 4 Door-Flex Bespoke Refrigerator	Samsung Electronics America Inc.
Samsung Cube Collection Beauty Refrigerator	Samsung Electronics America Inc.
Samsung Cube Collection Beer Refrigerator	Samsung Electronics America Inc.
Samsung Cube Collection Wine Refrigerator	Samsung Electronics America Inc.
Samsung Family Hub 5.0	Samsung Electronics America Inc.
Samsung Portable Slim Double Induction	Samsung Electronics America Inc.
Samsung Shoe Dresser	Samsung Electronics America Inc.
Smart Door Lock & Keys	Netatmo (part of the Legrand group)
The Round(R) Smart Thermostat	Resideo
TOWNEW, Self-Sealing Self-Changing Trash Can	**TOWNEW Intelligent Technology Co. Ltd.**
TripleCare Dishwasher	SK Magic

Home Audio/Video Components & Accessories

FMike	Sabinetek - Beijing Sabine Technologies Ltd.
Formovie Laser TV 4K Cinema	Formovie Technology Inc.
IQstreamTV + IQbuds2 Max Bundle	Nuheara
LA60T Soundbar	Samsung Electronics America Inc.
LG Sound Bar (SM9YG)	LG Electronics Inc.
Norm Glasses	**Human Capable Inc.**
Philips Universal Remote Companion w. Flip & Slide™ Cradle	Jasco
Q950T Soundbar	Samsung Electronics America Inc.
Sony PS-LX310BT Turntable	Sony Electronics Inc.
TYXIT RISES	TYXIT
VIZIO Elevate Sound Bar	VIZIO Inc.

In-Vehicle Entertainment & Safety

Product Name	Company Name
3D Semantic Camera	**Outsight**
Aurora platform - customizing cluster and service system	Motrex
BLU3 E20	BluArmor
Bmmpr	Bmmpr
Bosch Virtual Visor	Bosch
Click-It	University of Antelope Valley LLC. / Click-It (DBA)
Cobra Road Scout Elite - Combined Detection, Video & Cloud	Cedar Electronics Inc.
Cockpit DMX*	**Mindtronic AI**
CYBEX Sirona S with SensorSafe™ Convertible Car Seat	CYBEX
In-Vehicle Ultra-High-Speed Connectivity Chipsets*	**Valens**
Invoxia Bike Tracker	Invoxia
Light filed Head Up Display	FUTURUS TECHNOLOGY

Mobile Devices & Accessories

Blok On Blok (BOB): Own your Data with The World's 1st Blockchain Phone	Pundi X
BM46	Hirose Electric Co. Ltd.
CARRY	Courant
Combining DSLR and Mobile: 12mm Ultra Wide Aspherical Lens	ShiftCam Limited
DWP-1020 5GNR Outdoor CPE	D-Link Systems
DWR-2101 5G NR MiFi	D-Link Systems
Fusion2Go Max	SureCall
Galaxy Fold	Samsung Electronics Inc.
Iné	LaFab US
Joué PLAY	JOUE
Klaxoon Teamplayer	Klaxoon
LG G8 ThinQ	LG Electronics USA Inc.
LG G8X ThinQ	LG Electronics USA Inc.
LG V50 ThinQ 5G	LG Electronics USA Inc.
Modular design of solar photovoltaic panels	Jackery Inc
NAIL POP	DSGLOBAL CO. Ltd.
Naztech Freedom+ True Wireless Earbuds	Hypercel Corp.

*Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
NETGEAR Nighthawk M5 - 5G Mobile Router	NETGEAR
Nokia 7.2*	**HMD Global**
Norm Glasses	**Human Capable Inc.**
PeriPage Takie-Printie	Xiamen iLead Tek Co. Ltd.
ROG Kunai Gamepad	ASUS
ROG Phone II	ASUS
Samsung Galaxy A50	Samsung Electronics Inc.
Samsung Galaxy A70	Samsung Electronics Inc.
Samsung Galaxy Note10 / 10+	Samsung Electronics Inc.
Samsung Galaxy S10 5G	Samsung Electronics Inc.
Samsung Galaxy Tab Active Pro	Samsung Electronics America Inc.
SmartMike+	Sabinetek - Beijing Sabine Technologies Ltd.
tori™ Explorer Pack.	BANDAI NAMCO Entertainment America
ZenFone 6	ASUS

Portable Media Players & Accessories

Product Name	Company Name
A&ultima SP2000	Astell&Kern
Mobius 5G: Innovative Communication	MIGU Co. Ltd.
MyFit Solutions - Custom-fit EarTips	MyFit Solutions
Presidio Pro for AirPods	Speck Products
Puppy Cube M1	Puppy Robot
XGIMI Halo - Android TV 1080P Home Cinema	Chengdu XGIMI Technology Co. Ltd.
XGIMI MoGo Pro - Android TV 1080P Portable Projector	Chengdu XGIMI Technology Co. Ltd.
Zenergy Aroma Dream	iHome/SDI

Robotics

Product Name	Company Name
Baci-baci	Lora DiCarlo
GANKER EX battle robot	GJS ROBOT
LOVOT	GROOVE X Inc.
Ondata	Lora DiCarlo
PingPong Robot	Robo Risen
Roomba® s9+ vacuum & Clean Base™ Automatic Dirt Disposal	iRobot
Smart Robots*	**Smart Robots Srl**

Smart Cities

Product Name	Company Name
24GHz IoT RADAR	Bitsensing Inc.
ACM multiple hazards detection system	Nestech Corp. Ltd.
Athena	Amaryllo Inc.
FITT360 LIVES	LINKFLOW
Helius Smart Lidar System	**Cepton Technologies Inc.**
Ninebot KickScooter Air T15	Segway-Ninebot
Norm Glasses	**Human Capable Inc.**
PROTECTONNECT	PROTECTO
Smart Logistic Tracker with Extreme Temperature Battery	Nano and Advanced Materials Institute Limited
Zac	Vivoka

Smart Home

Product Name	Company Name
AI Motion Air Purifier	SK Magic
All New Sleep Number 360® Smart bed	Sleep Number
Arlo Floodlight	Arlo Technologies Inc.
Arlo Pro 3	Arlo Technologies Inc.
Athena	Amaryllo Inc.
BenjiLock - Luca Fingerprint Door Lock	BenjiLock LLC.
B-hyve Smart Sprinkler Timer*	**Orbit B-hyve**
Brilliant Switch	Brilliant
C by GE Smart Switch & Dimmer Family	GE Lighting
CareOS Poseidon	CareOS, a Baracoda Company
Cubo AI Smart Baby Monitor	YunYun US Corp.
CYBEX e-PRIAM	CYBEX
Essence Portable Decorative Lantern	HeathCo
Finet*	**Leedarson Lighting Co. Ltd.**
Halo Air 5G WiFi6 Intelligent Whole-Home Wi-Fi System	Zyxel Communications Inc.
Home Complete	weBoost
HomeHawk FLOOR	Panasonic Consumer Electronics Company

Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
iKuddle Auto-pack Smart Litter Box	Original Technology INC
Kangaroo Privacy Camera	Kangaroo
KOHLER Numi 2.0 Intelligent Toilet	Kohler Co.
LG Sound Bar (SM11RG)	LG Electronics Inc.
LifeDoor LD1	LifeDoor inc.
LuluPet AI Smart Cat Litter Box	LuluPet Inc
Lutron Aurora Always Ready smart bulb dimmer	Lutron Electronics Co. Inc.
M3 Haven Smart Home System	Mercku
Nanoleaf Unified Light Panels - Hexagons	Nanoleaf
Ocheck*	**Leedarson Lighting Co. Ltd.**
Optix MEG381CQR	MSI Computer
PECOLA	Industrial Technology Research Institute (ITRI)
Phyn Smart Water Assistant	Phyn
puripot airLamp: Air purifying lamp with photocatalyst	Dadam Micro Inc.
Quantum	Bodyfriend Inc.
Roborock S5 Max	Shenzhen Rocktimes Technology Co. Ltd.
Samsung Family Hub 5.0	Samsung Electronics America Inc.
Samsung WF8500V Front Load Washer	Samsung Electronics America Inc.
SECURAM Touch*	**SECURAM Systems Inc.**
Shepherd Lock*	**PassiveBolt Inc.**
Smart Kitchen Cooking Machine	TecPal Ltd.
Smart TV Platform w/ Multi-AI and Home Dashboard	LG Electronics Inc.
Sonesse ULTRA 30 WireFree™ Zigbee Li-Ion	Somfy Activités SA
SureFeed Microchip Pet Feeder Connect	Sure Petcare
Swann Security Tracker Camera	Swann Communications Inc.
Tile Sticker	Tile
Tineco Floor One 3 Smart Floor Washer	Tineco Intelligent Technology Co. Ltd.
Twinkly Strings Special Edition	LEDWORKS SRL

Product Name	Company Name
uHoo	uHoo Pte Ltd
Venus, Smart Makeup Mirror*	**ICON AI Inc.**
Wayzn Smart Sliding Glass Door Opener	Wayzn
Wireless Gateway Thermostat	Computime
Wyze Sense	Wyze Labs Inc.

Software & Mobile Apps

Product Name	Company Name
AI Codec and AI-AI Bit Rate Streaming	Samsung Electronics America Inc.
Arnoo*	**Leedarson Lighting Co. Ltd.**
CodeCheck App*	**CodeCheck AG**
DIPONGO	DIPONGO
DoodleMatic Mobile Game Maker	Tink Digital Inc
Dream Lab	Owlet Baby Care
FigLeaf	FigLeaf App Inc.
Fluent.ai Multi-Wake Word + Voice Control Engine	Fluent.ai Inc.
Forum	Fasetto Inc.
Immoshoot	Quantum Equity
Insight Instant Mesh WiFi Solution	NETGEAR
Linksys Aware	Belkin International - Linksys
Neuro-World	Woorisoft.Inc
Roland Zenbeats App	Roland
Samsung Global Goals	Samsung Electronics Inc.
Samsung Pay	Samsung Electronics Inc.
Traffic Lights for Sygic GPS Navigation	Sygic
Weber Connect Smart Grilling Hub	Weber-Stephen Products LLC.
YouCam platform and suite of apps*	**Perfect Corp.**

Sustainability, Eco-Design & Smart Energy

Product Name	Company Name
CoCoon	BeeLife
Green Systems Automotives	Green Systems Automotives
Greenplay Biomaterial Headset	Pixminds
HP EliteDisplay E273d 27-inch Docking Monitor	HP Inc.

Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
Legrand Smart Electrical Panel with Netatmo	Legrand
Liberate Air	House of Marley
Mobile Fuelcell Powerpack(DP30)	Doosan Mobility Innovation
Ninebot KickScooter Air T15	Segway-Ninebot
Samsung Serif Eco-Package	Samsung Electronics America Inc.
Sherpa Tunable Light for Agriculture	Sherpa Space Inc.
Smart Cane for the Blind with Independent Power Technology	Hanyang University
Smart Wall Electronic Outlet Cover	Powertech Industrial Co. Ltd.
Solar GENNY by Watergen	Watergen
VOLUMIC ULTRA SUPERCHARGED	VOLUMIC 3D
Wheelswing-VOLT	WITHUS & EARTH

Tech for a Better World

Product Name	Company Name
AerNos AerSIP	AerNos
AgriTalk Farming Sensor	AgriTalk Tech
All New Sleep Number 360® Smart bed	Sleep Number
All New Sleep Number Climate360® Smart bed	Sleep Number
ANDE Rapid DNA Identification System	ANDE Corp.
BeHear ACCESS	Alango - Wear & Hear
Climate BE1	Inspire
Clue	Clue Insights Inc
Coolfinity IceVolt 300*	**Coolfinity**
CTRL-kit	CTRL-labs
ExoBeam Walking Assistive Device for Parkinson's Disease	MedEXO Robotics (Hong Kong) Company Limited
exoRehab	EXOSYSTEMS Inc.
EyeQue Vision Monitoring Kit	EyeQue Inc.
Food Rescue Hero - People Powered #Tech4Good*	**Food Rescue Hero**
Green Systems Automotives	Green Systems Automotives
Greenplay Biomaterial Headset	Pixminds
Greenplay Biomaterial Keyboard	Pixminds
Greenplay Biomaterial Mouse	Pixminds
Helius Smart Lidar System*	**Cepton Technologies Inc.**
Highest areal capacity full-range flexible battery	**LiBEST Inc.**
IntelEvac(Intelligent Evacuation)	Corners Co. Ltd.
John Deere 8RX Tractor	John Deere
Kytera Companion - Smart Remote Caregiver for Aging at Home	Kytera
Legrand Smart Electrical Panel with Netatmo	Legrand
MedWand	MedWand Solutions Inc.
Multi-function Smart Window Film	Brilliant Optronics
Oticon RemoteCare	Oticon Inc.
Phyn Smart Water Assistant	Phyn
PLACA, Curtain Disinfection System with Air Purifier	AIMD Inc. - Hanyang University
Samsung Global Goals App	Samsung Electronics Inc.
SAMSUNG MICROLED TECHNOLOGY	Samsung Electronics America Inc.
Smart Beat Advanced	Smart Beat
TALI: 1st Smart and Safe Helmet connected to the Motorcycle	TALI Connected
Tenavolts AAA lithium rechargeable battery	Fujian Nanping Nanfu Battery Co. Ltd.
The BOX*	**LivingPackets SAS**
Vivascope	Robert Bosch Engineering and Business Solutions Pvt Ltd
VivO2	Prenatal Hope

Vehicle Intelligence & Transportation

Product Name	Company Name
Bird One	Bird
BladeScan ADB*	**Koito Manufacturing Co. Ltd.**
Blickfeld Cube - solid-state LiDAR for the mass market	Blickfeld
Bosch 3D Display - for automotive applications	Bosch
Bosch SensorBox	Robert Bosch GmbH

Product descriptions begin on page 64.

2020
INNOVATION AWARD HONOREES

Product Name	Company Name
CIRRUS by Panasonic	Panasonic Corp. of North America
DeepRoute L4 Full Stack Self-Driving System	Shen Zhen Deeproute.ai Co. Ltd.
DFG-aided Optical Sensor (DOS)*	**Microsystems Inc.**
E-colibri	Mobility Tech Green
FX26	Hirose Electric Co. Ltd.
HiRide Suspension*	**HiRide Suspension S.r.l.**
Insight	Renovo Auto
KickScooter T60 by Segway	Segway-Ninebot
Leddar PIXELL: The Cocoon LiDAR for Autonomous Vehicles*	**LeddarTech**
Long-distance ToF Module—Mars F1	Zhejiang Sunny Optical Intelligence Technology Co. Ltd.
Mobileye 8 Connect™	Mobileye, an Intel Company
OS2-128 Long-range lidar sensor	Ouster Inc.
ProovStation	ProovStation
Regulus Pyramid GNSS	Regulus Cyber
RoboSense Smart LiDAR Sensor: RS-LiDAR-M1	Suteng Innovation Technology Co. Ltd. (RoboSense)
Smacircle S1*	**Smacircle LMT Ltd.**
TCHEK	TCHEK
Transparent Hood	Continental
TriEye's Raven SWIR Camera	TriEye
Uhnder Radar-on-Chip (RoC)	Uhnder
VIPER	ADASKY

Video Displays

Product Name	Company Name
85” Q80T	Samsung Electronics America Inc.
LG 88-inch OLED 8K TV (Model OLED88ZX)	LG Electronics Inc.
Samsung 75” Q800 8K QLED TV	Samsung Electronics America Inc.
SAMSUNG 85” Q950 8K QLED TV	Samsung Electronics America Inc.
Samsung Fixed MicroLED TV	Samsung Electronics America Inc.
Samsung MicroLED Modular 8K Display	Samsung Electronics America Inc.
Sony MASTER Series A9G	Sony Electronics Inc.
Sony MASTER Series Z9G	Sony Electronics Inc.

Virtual & Augmented Reality

Botzees	Pai Technology
CTRL-kit	CTRL-labs
Cybershoes® step into VR	Cybershoes
FITT360 LIVES	LINKFLOW
Ganzin Eye Tracking Module - AURORA	Ganzin Technology Inc.
Haptic Mobile Phone	HAP2U
HP Reverb Virtual Reality Headset	HP Inc.
HTC VIVE Pro Eye	HTC VIVE
Pico Neo2	Pico Technology Co. Ltd.
Pilot One 8K 360° Camera	Shenzhen Pisoftware Technology Co. Ltd.
ROOMY	dear architect
tori™ Explorer Pack.	BANDAI NAMCO Entertainment America

Wearable Technologies

Ambassador Interpreter	Waverly Labs Inc.
AURA Strap for Apple Watch	AURA Devices
CarePredict Tempo™	CarePredict
Core ScanWatch	Withings
fenix® 6X Pro Solar	Garmin Ltd.
Galaxy Watch Active2	Samsung Electronics Inc.
IQbuds2 Max	Nuheara
iStimUweaR	Industrial Technology Research Institute (ITRI)
JARVISH X-AR smart helmet	Jarvish Inc.
Lab-on-Skin™	Xsensio
NextMind	NextMind
SMART BELT - Fall Prevention	WELT
Smart Swim	Vuzix Corp.
Sonic Frames: 1st Augmented Communication Experience	5th Dimension
SpotOn Virtual Smart Fence	OnPoint Systems LLC.

Product descriptions begin on page 64.

2020 INNOVATION AWARD HONOREES

Product Name	Company Name
ThermoReal® (Made with Flexible Thermoelectric Device)*	**TEGWAY Co. Ltd.**
WAHU!*	**WAHU S.r.l.**
Wearable air purifier - reduce inhalable PM2.5 & allergens	ible Technology Inc.
Xenxo S-Ring	RajMall Inventives LLC.

Albi Home M

Albicchiere - beexlab

Category: Home Appliances

Albi Home, The Smartest Wine Dispenser, allows you to drink your wine at the perfect temperature and preserve it for up to six months from the opening date. Let Albi suggest the best wine for every moment.

albicchiere.com

Aftershokz Xtrainerz

Aftershokz

Category: Headphones & Personal Audio

Built to withstand all elements, allowing athletes to swim, run, bike and train harder with no wires, no devices, and no limits. The most advanced bone conduction technology powers AfterShokz' first waterproof MP3 headphone.

aftershokz.com

ANC True Wireless In-Ear Headphones

1MORE

Category: Headphones & Personal Audio

Turn on, tune in, block out, with 1MORE's first multi driver and active noise-cancelling true wireless headphone. The True Wireless ANC earbuds feature a hybrid dual driver design, 2 levels of active noise cancellation, Bluetooth 5 technology with aptX and AAC compatibility, and a portable charging case with 22 hours of playtime.

1more.com

Arnoo

Leedarson Lighting Co. Ltd.

Category: Software & Mobile Apps

Arnoo is an easy-to-use smart home application. Users can connect and control their home devices, arm and disarm the security system, and keep an eye on the happening at home no matter where they are with Arnoo.

leedarson.com

AVITA ADMIROR

AVITA

Category: Computer Hardware & Components

Drawing inspiration from architecture, high fashion and colorful modern style, the Admiror boasts unparalleled aesthetic beauty. An available ultra-HD 4K touchscreen provides discriminative clarity and intuitive brilliance. There's more to marvel under the hood thanks to an Intel® core™ power processor and a solid-state drive.

avita-americas.com/product/admiror

Bartesian

Bartesian

Category: Home Appliances

Stock Bartesian with your preferred brands of spirits. Insert your recyclable cocktail capsule choice which contains all real ingredients. Customize pour strength and press mix; Bartesian automatically draws spirits over their own lines, mixing with the capsule contents as it's dispensed in seconds. Bartesian then auto rinses between cocktails.

bartesian.com

B-hyve Smart Sprinkler Timer

Orbit B-hyve

Category: Smart Home

With B-hyve, you can control your entire sprinkler system on your smart phone from anywhere. B-hyve connects to Wi-Fi and automatically adjusts to any changes of season and weather, so you aren't watering in the rain.

Mybhyve.com

CES
INNOVATION
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HONOREE

2020 INNOVATION AWARD HONOREES

BladeScan ADB

Koito Manufacturing Co. Ltd.

Category: Vehicle Intelligence & Transportation

ADB keeps high-beam headlamp visibility while avoiding glare to vehicles ahead. By turning on/off 12 LEDs while scanning with blade-mirrors' rotation, BladeScan ADB ensures high-resolution light-distribution equivalent to use of hundreds of LEDs while minimizing shading area. It helps drivers to detect pedestrians early.

Koito.co.jp/english/

ClearUP Sinus Pain Relief

Tivic Health Systems Inc.

Category: Health & Wellness

Whether you're one of 50+ million who suffer from allergic rhinitis – seasonal or year-round allergies – ClearUP uses a microcurrent to provide drug-free sinus pain relief without a prescription. A handheld device ClearUP uses no chemicals, is non-invasive, clinically proven and FDA-cleared.

Tivichealth.com

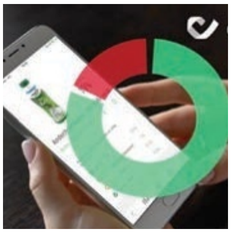
Cockpit DMX

Mindtronic AI

Category: In-Vehicle Entertainment & Safety

DMX is a AI cockpit for automotive employing high quality biometric technology for a luxury UX and interactions, and also a DMS for evaluating driver's cognition to bridge with ADAS for a seamless handover between human and self-driving.

Mindtronicai.com



CodeCheck App

CodeCheck AG

Category: Software & Mobile Apps

CodeChecks goal is to help people live a healthier and more sustainable lifestyle by enabling them to make better purchasing decisions. CodeCheck offers a unique solution to scan bar codes on food and cosmetics and get a scientific rating on the ingredients.

codecheck-app.com

Coolfinity
Coolfinity

Coolfinity IceVolt 300

Coolfinity

Category: Tech for a Better World

In countries with limited power (on grid or solar) cooling is a challenge. Working under harsh tropical conditions, Coolfinity changes lives through cooled medication & preventing food waste. The fridge needs six hours of power/day for 24 hours of cooling.

coolfinity.com

Dell OptiPlex 7070 Ultra and Height Adjustable Stand

Dell Technologies

Category: Computer Hardware and Components

The industry's most flexible, zero-footprint desktop design, the OptiPlex 7070 Ultra is beautiful, space-saving, and clutter-free; as well as fully modular so customers can configure and upgrade as needed throughout the lifecycle of the product.

Dell.com

Dell UltraSharp 27 4K PremierColor Monitor UP2720Q

Dell Technologies

Category: Digital Imaging/Photography

Engineered for creative professionals, Dell UltraSharp 27 4K PremierColor Monitor (UP2720Q) is the world's first 27" 4K monitor with built-in colorimeter and Thunderbolt™ 3 connectivity. It delivers impeccable color, remarkable details, and fast, powerful connectivity.

Dell.com

DFG aided Optical Sensor (DOS)
Normal Optical Sensor
DOS

DFG-aided Optical Sensor (DOS)

Microsystems Inc

Category: Vehicle Intelligence & Transportation

DFG-aided Optical Sensor (DOS) is automotive and IoT sensors with an advanced self-cleaning technology that can promptly remove various contaminants on the sensor's lens using a unique microfluidic technology.

microsystems.co.kr

2020 INNOVATION AWARD HONOREES

DigiSAFE PhoneCrypt D200

ST Electronics Info-Security
Category: Cybersecurity & Personal Privacy

DigiSAFE PhoneCrypt D200 is an innovative seamless design that incorporates both a desk and Android phone to provide end-to-end Secure Voice over IP and Instant Messaging in real-time for the enterprise dynamic environment. Its robust engineering design with multiple security layers provides resilient encryption in secure communication.

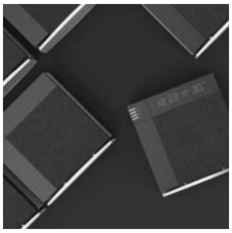
digisafe.com/products/phonecrypt-series

Dual Driver ANC Pro Wireless Headphones

1MORE
Category: Headphones & Personal Audio

1MORE's Pro version of the Dual Driver ANC BT Headphones feature better specs, and better features at the same industry disrupting value. The Dual Driver ANC BT Pro Headphones combine 1MORE's innovative hybrid dual driver design with revolutionary noise cancellation technology so you can enjoy tranquility anytime, anywhere.

1more.com



Finet

Leedarson Lighting Co. Ltd.
Category: Smart Home

FINET is an IoT wireless intelligent security gateway with backup power. It provides wireless long-distance big data transmission with 5G networks and provides gigabit speeds as a link between the connection sensing layer and the network layer. The gateway is built-in based on the Qualcomm solution and supports 3G, 4G, 5G multimode.

leedarson.com

Food Rescue Hero - People Powered #Tech4Good

Food Rescue Hero
Category: Tech for a Better World

Americans waste 40% of our food. Food Rescue Hero changes that. This app, now in six cities, has mobilized the largest volunteer transport network globally to rescue over eight million pounds of healthy food. With volunteers just a push notification away, we can eradicate food and transit deserts for good.

foodrescuehero.net

Helius Smart Lidar System

Cepton Technologies Inc.
Category: Smart Cities,
Tech for a Better World

The Helius Smart LiDAR system combines state-of-the-art 3D LiDAR with edge computing and advanced perception software, providing real-time object detection, tracking and classification to enable a wide range of applications for smart cities, intelligent transport systems, security and beyond.

cepton.com/helius.html

HiRide Suspension

HiRide Suspension S.r.l.
Category: Vehicle Intelligence & Transportation

HiRide designs, develops and manufactures smart active suspensions for sport bicycles. HiRide's suspensions, through sophisticated dynamic control algorithms, understands maneuvers, riding style and road conditions adjusting automatically the softness of the frame to increase comfort, safety and performance.

hiride.bike

HomeCool

OxiCool Inc.
Category: Home Appliances

OxiCool will launch its flagship product HomeCool at CES. HomeCool is powered by OxiCool technology and is the cleanest and quietest AC on the planet. It uses water as a refrigerant instead of greenhouse gases used in other AC's.

Oxicool.com/index.html

2020 INNOVATION AWARD HONOREES

In-Vehicle Ultra-High-Speed Connectivity Chipsets
Valens
Category: In-Vehicle Entertainment & Safety

One Technology, Infinite Possibilities: Valens Automotive chipsets enable superior in-vehicle connectivity with ultra-high speeds over the simplest infrastructure, expanding the capabilities of the connected and autonomous cars. By supporting flexible and scalable architectures and delivering superior performance, Valens Automotive addresses the needs of multiple in-vehicle applications.

Valens.com/automotive-products

Leddar PIXELL: The Cocoon LiDAR for Autonomous Vehicles
LeddarTech
Category: Vehicle Intelligence & Transportation

A 3D flash Solid-State LiDAR with a 180-degree field of view for ADAS and AD applications that demand reliable detection of pedestrians, cyclists and other obstacles in the vehicle's vicinity; ideal for use in perception platforms designed to ensure the safety and protection of vulnerable road users.

direc.to/cJ71

Narwal world's first self-cleaning robot mop & vacuum
Yunjing Intelligence
Category: Home Appliances

Narwal is the world's first robot mop and vacuum featuring innovative self-cleaning technology. With groundbreaking self-cleaning technology, Narwal signals the start of a new era of fully automatic robot cleaners, where you can enjoy a truly hands-free floor cleaning experience.

narwalrobotics.com

Nokia 7.2
HMD Global
Category: Mobile Devices & Accessories

The Nokia 7.2 is the first Nokia smartphone to combine a 48MP triple camera and PureDisplay with Quad Pixel technology and ZEISS Optics. An Android One device, it features a range of ZEISS bokeh styles for high visual impact and signature blur, always-on HDR, AI-powered features and timeless Nordic design.

nokia.com

Ocheck
Leedarson Lighting Co. Ltd.
Category: Smart Home

Ocheck is an innovative, patented smart device that detects when a door or window is manually opened and sends an alarm to your mobile phone immediately. The sensor remains alert even when the door or window is already opened by the homeowner. Ocheck is the first door window sensor with our patented open protection function.

leedarson.com

Oral-B iO
Procter & Gamble's
Category: Health & Wellness

With Oral-B iO, the future of brushing is now. From its iconic, dentist-inspired round brush head and elegant design to its innovative internal magnetic drive, Oral-B iO is unlike any brushing technology, both inside and out.

Oralb.com/en-us

Pria by BLACK+DECKER
Stanley Healthcare
Category: Health & Wellness

Pria™ by BLACK+DECKER™, is a HIPAA-compliant platform, voice-enabled tabletop robot that provides caregivers insight into their loved one's adherence to medication therapy and wellbeing through a mobile application. Pria proactively facilitates in-home healthcare management providing access to caregivers with a simple voice command and built-in camera for two-way video calls.

okpria.com

2020 INNOVATION AWARD HONOREES

React True Wireless

1MORE

Category: Headphones & Personal Audio

Working out will never be the same again. The React True Wireless Headphones are built to take your workouts to the next level. Featuring water and sweat resistance, heart rate sensor, and an independent DSP for voice commands, these true wireless earbuds can handle anything you throw at them.

1more.com

SECURAM TOUCH
The World's First Fingerprint Smart Deadbolt Lock
SECURAM

SECURAM Touch

SECURAM Systems Inc.

Category: Smart Home

SECURAM Touch is the first smart fingerprint deadbolt lock for your front door. It features One Touch fingerprint access using state of the art RF fingerprint recognition to provide fast access to your home. No more fumbling for keys to open your front door. Simply touch the fingerprint sensor and welcome home. In addition SECURAM Touch can be managed and controlled remotely using our smartphone app.

securamsys.com

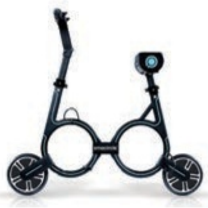
Shepherd Lock

PassiveBolt, Inc.

Category: Smart Home

Shepherd Lock is first to use sensors and AI to monitor your door lock 24/7. It detects lock tampering and notifies the homeowner. Shepherd works with existing deadbolts, offers touch-enabled access, remote lock/unlock, access history, and electronic key sharing.

passivebolt.com



Smacircle S1

Smacircle LMT Ltd.

Category: Vehicle Intelligence & Transportation

An ideal solution for "first mile last mile" transportation. With carbon fiber frame and unique design, the S1 can easily be folded in five simple steps into a small backpack and carried wherever and whenever. Smacircle is a unique vehicle that transforms people's mundane everyday transit into an entertaining, meaningful, individually tailored, never-repeating, endless experience.

Smacircle.com

Smart Robots

Smart Robots Srl

Category: Robotics

Smart Robots product is an intelligent device which supports the operator in smart factories. Unique capabilities in recognizing human actions are applied to monitor and guide the operators during manual activities to eliminate costly errors, and to enable collaboration with a robotic co-worker to increase human productivity.

smartrobots.it

The BOX

LivingPackets SAS

Category: Tech for a Better World

The media calls it "next generation packaging that is going to revolutionize e-commerce." LivingPackets developed the world's first intelligent connected box for the global e-commerce market. It can be used up to a 1000 times and helps prevent packaging waste.

Livingpackets.com

THERMO REAL
Facial_TR

ThermoReal® (Made with Flexible Thermoelectric Device)

TEGWAY CO LTD

Category: Wearable Technologies

ThermoReal® is a temperature feedback haptic device that can stimulate the ultimate sensation experience in all areas of VR, AR, game, 4D movie, and stimulators. Like the movie "Ready Player One," ThermoReal® allows users to fully engage and immerse in their gaming experience by feeling various temperatures and even pain along with their gaming content.

tegway.co

Venus, Smart Makeup Mirror

ICON AI Inc.

Category: Smart Home

Venus is a Smart Makeup Mirror with seven-inch touchscreen LCD with Alexa built-in, 360 degree omni-directional speakers, Bluetooth, table mood lamp, LED ring lights for makeup, anti-fingerprint/tempered mirror, Wi-Fi, two microphones, camera with built-in shutter and skin diagnostic, AR makeup, etc.

ICON.AI

2020 INNOVATION AWARD HONOREES

WAHU!
WAHU S.r.l.
Category: Wearable Technologies

WAHU product is the very first active sole able to adapt its morphology to changes both in the external environment, like terrain, temperature or humidity, and in the dynamic state of the user. The sole has the right balance between the hi-tech functionality, provided by the latest technology, and the style, provided by the unique Italian design.

WAHU.it

YouCam platform and suite of apps
Perfect Corp.
Category: Software & Mobile Apps

YouCam is the world's leading beauty tech solutions provider, marrying the highest level of augmented reality, artificial intelligence, and machine learning technologies to reimagine the way consumers, brands, retailers, and content creators discover, try, share and shop for beauty.

perfectcorp.com ■

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JANUARY 6-9, 2021
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Policy

76

Guest Blog

Megatrend: Iris Biometrics

THE PACE OF TECHNOLOGY

Encouraging Innovation to Prosper

71 Policy Update 76 Guest Blog 78 Policy in Action 81 Faces of Innovation 82 Green Policy 83 Policy News 86 Tech Hub

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POLICY UPDATE

Tom Werner/Getty Images

Leading a National Dialogue on Diversity and Inclusion

The tech industry is the driver for innovation and creativity. New technologies help people lead better lives, connect with loved ones and discover solutions to the world's most complex problems. Yet the sector has struggled to include a better representation of all those it serves.

Today, women and traditionally underrepresented groups hold one-third of all tech jobs, according to CTA's *2019 Economic Impact Study*. Despite the surge of tech positions in the last three decades, the proportion of women in computing jobs decreased by 5% between 1991 and 2017.

In his book *Ninja Future: Secrets to Success in the New World of Innovation*, CTA President and CEO, Gary Shapiro stresses that diversity is the bedrock of innovation. Unique thoughts, experiences and skills bring "new ideas that are best fostered in organizations where people come from different backgrounds."

For the last several years, the industry has taken several steps to diversify the workforce and create inclusive cultures. To drive that change forward, CTA recently launched the Diversity and Inclusion Working Group — a leadership forum that is bringing together more than 40 member companies to discuss ways to create greater access and mobility for women, people of color and other traditionally underrepresented communities, and foster a diverse and inclusive tech ecosystem.

Diversity is the bedrock of innovation.

The founding members of this working group — ranging from tech giants to startups — will lead an important national dialogue to help inform their business practices and share ways to prioritize diversity. Participants will share best practices from successful diversity initiatives centered on building a diverse K-12 STEM pipeline, recruitment and hiring, retention, advancement and leadership development, and investment into diverse entrepreneurs. The group aims to deliver the benefits of a diverse, inclusive ecosystem to tech companies and the workers of the future.

Success Stories

Many companies are instituting programs to move the needle on diversity and inclusion. For example, HARMAN Women's Network (HWN) is a robust initiative designed to help shape the company into an employer-of-choice for women. HWN is responsible for executing HARMAN's global diversity and inclusion strategy through its regional Women's Leadership Summit — a training and professional development forum helping to prepare women for leadership.

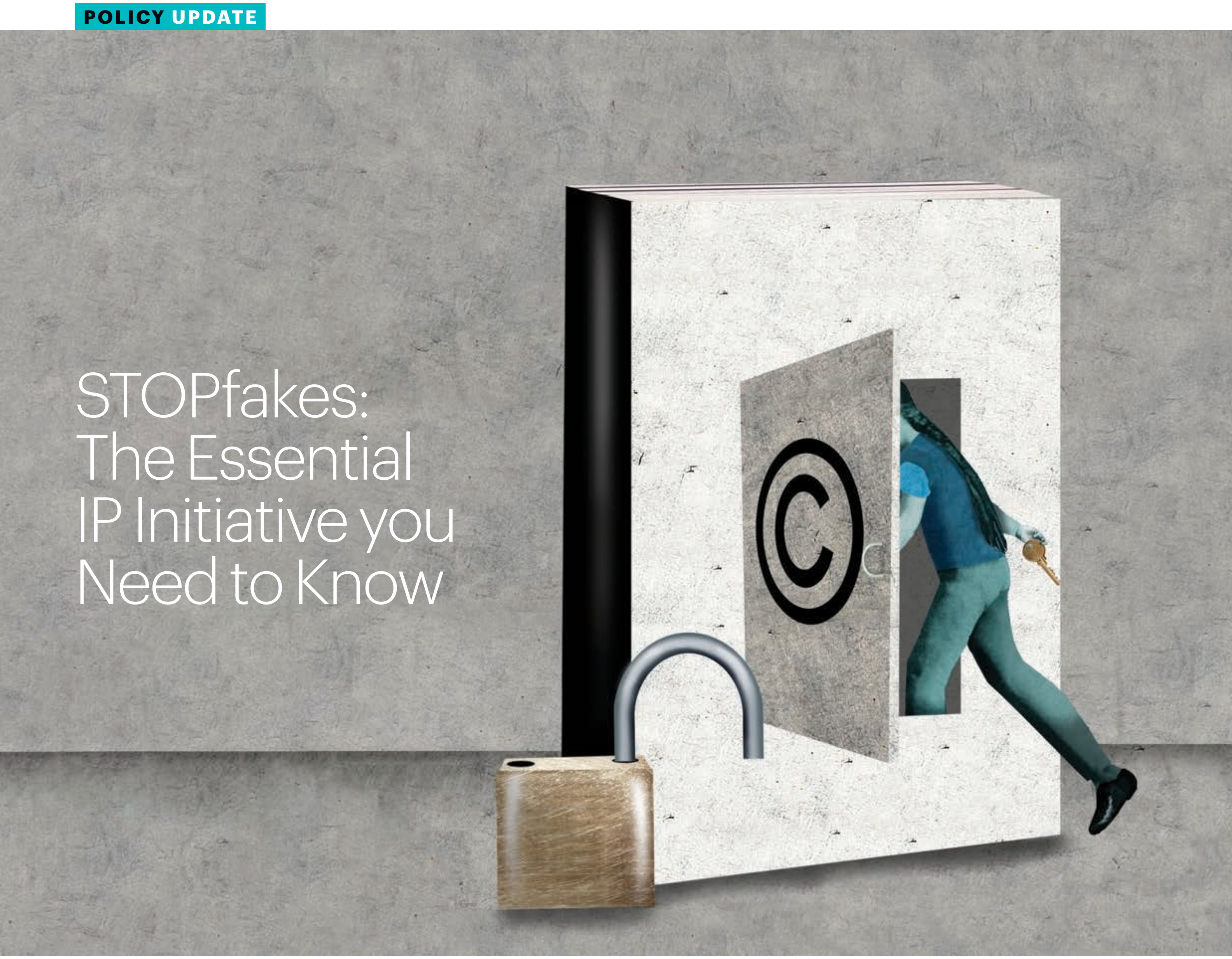
To tackle diversity and inclusion holistically, Uber created a core framework to consider every element of the cultural change needed to bring about positive progress. The company focused on four areas: individual employees, systems, leadership and citizenship. In less than two years, this work expanded employee resource groups from seven to 15, increasing member participation from around 2,000 to almost 7,000 across the company.

In addition, female employees at AEye launched a new forum called Women in Autonomy to provide a place for women's voices in the automotive and auto tech industries to be heard.

Individually, these companies are creating innovative and inclusive workplace cultures. Together, they will create an impact on the tech industry. To learn more about the work of the D&I Working Group, visit **CTA.tech.** ■

POLICY UPDATE

STOPfakes: The Essential IP Initiative you Need to Know



Michael Morgenstern/Theispot.com

The International Trade Administration's Office of Standards and Intellectual Property (OSIP) manages the interagency initiative known as STOPfakes. The initiative includes the STOPfakes.gov website, the STOPfakesGov Twitter account, and the STOPfakes Roadshows.

STOPfakes.gov

STOPfakes.gov hosts several resources to educate and assist businesses, consumers, government officials, and the general public about intellectual property (IP) and how to handle problems.

Industry Specific IP Toolkits

Industry brochures contain information about IP treaties and processes that are geared toward specific industries and are essential to successful exporting. These toolkits provide guidance to U.S. companies seeking to acquire and protect copyrights, patents, trademarks, and trade secrets in overseas markets. Current industries covered include: sporting goods, marine technology, pleasure boats, medical devices, auto parts and building products.

IP Snapshots

IP Snapshots are one-page documents that provide IP information about a foreign country. The following information is included on each IP Snapshot:

- Contact information for local IP offices.
- Country membership in important IP treaties.

If the problem is a report of infringing activity, the response will provide:

1. A link to a guide for reporting IP crimes that is published by the Computer Crime and Intellectual Property Section of the Department of Justice.
2. A link for reporting IP violations to the National Intellectual Property Rights Coordination Center.
3. If relevant to the complaint, links to the major online marketplaces where infringement can be reported.
4. Direct contact with the person making the report to better assist and explain the IP landscape.

STOPfakes.gov Button

The STOPfakes.gov button will be licensed for use on websites, and when clicked, will direct the user to the STOPfakes.gov website and its various resources and reporting mechanism.

- Special 301 ranking for the last three years.
- Contact information for the IP attaché in the region.

Seventy-two IP Snapshots are currently available on STOPfakes.gov.

Country IP Toolkits

Country Toolkits are more in-depth documents to assist U.S. entrepreneurs in understanding the ins and outs of IP protections in foreign markets. Available toolkits include China (new), Singapore, Malaysia, Vietnam, Brunei, Brazil, Colombia, Egypt, European Union, Italy and Peru with more being developed.

Report IP Infringement

Reports may be submitted via email at stopfakes@trade.gov and are managed by the Office of Standards and Intellectual Property.

Other popular forms of information provided include links to U.S. Customs and Border Protection online application to record trademarks and copyrights; the link to the U.S. Copyright Office to register works; description of resources that can be found on STOPfakes such as industry IP toolkits, Country Snapshots, and information about upcoming roadshows; and common steps taken by rights holders to enforce their private rights.

> **Audiences that need IP help the most are startups, entrepreneurs, small and medium-sized businesses, independent creators, and inventors.**

STOPfakes Roadshows

STOPfakes Roadshows deliver critically important information about intellectual property to the audiences that need it most — startups, entrepreneurs, small and medium-sized businesses, independent creators and inventors. The information is presented by experts from multiple government agencies whose missions' advance stakeholders' intellectual property interests.

Participants receive information on a range of topics, including how to identify and protect various IP assets; mechanisms for obtaining IP protection in overseas markets; strategies for determining where to seek protection; and the value of copyright and trade secrets protection to their businesses.

Three signature offerings of the roadshows include the ability to meet one-on-one with any of the speakers, apply for copyright registration with the help of copyright office staff, and apply for recordation of a trademark or copyright with Customs. This innovative and interactive approach to outreach is the base on which we continue to build public awareness of intellectual property.

STOPfakes Roadshow

The STOPfakes.gov team and the U.S. Patent and Trademark office's Elijah J. McCoy midwest regional office are partnering to host a daylong seminar that examines intellectual property issues faced by the auto industry. We are interested in learning more about problems facing the industry, and how the U.S. government can assist businesses in this area. This seminar will discuss both emerging challenges and new twists on long-standing problems regarding imitations and unauthorized usage in the marketplace. If existing government resources or processes have proved helpful, we'd like to hear about that as well. Visit STOPfakes.gov for the full schedule.

IP Highlights

These pamphlets provide information on a variety of issues relevant to intellectual property and are available on **STOPfakes.gov**. ■

For information, contact: Benjamin.Hardman@trade.gov

By Meredith Broadbent, senior advisor,
Center for Strategic and International Studies (CSIS)

POLICY UPDATE

Improving the International Legal Framework Governing Digital Trade

Step one: extend the WTO e-commerce moratorium on customs duties

Headlines referring to the fraying World Trade Organization (WTO) legal system because of U.S. opposition to the Appellate Body dispute settlement mechanism have recently populated the international trade press. These predictions of doom for the WTO system of fair trade rules for products are perhaps premature and exaggerated, at least during this period leading up to the 12th WTO Ministerial meeting in Kazakhstan on June 8-11, when a negotiated solution to the impasse may emerge.

A more immediate concern is the looming expiration of the WTO's customs duties moratorium on electronic transmissions, commonly referred to as the "e-commerce moratorium," in December 2019. Although a mouthful, expiration of this temporary agreement to forgo applying duties on digital products transmitted electronically over the internet could have a serious negative impact on the international trading system, particularly as it applies to the tech sector.

With global cross border data flows reaching $2.8 trillion in 2014, the stakes are high.

Digital Trade

Unlike international trade in traditional goods (physical products) which is governed by a wholistic set of free and fair trade rules, the governance of electronic transmissions and digital trade through permanent, binding obligations is relatively weak. For digitally-delivered products and services, there are no permanent agreed principles of non-discrimination, national treatment and "least trade restrictive" (given domestic regulatory objectives) like those that promote predictability for international trade in physical goods. The temporary exception to this Wild West of weak rules for digital trade has been the moratorium. Services now account for half of global trade on a value-added basis and are growing while merchandise trade is decreasing. Much of the services trade is tied to the growth of digital trade and the rise in digitally enabled services. At the same time, trade restrictive measures, particularly in digital trade, are also growing.

A relatively dependable element of WTO rules since 1998, the moratorium has been extended successively in two-year increments since then. Recently, however, developing country opposition to extension has hardened. India, South Africa, and Indonesia are increasing outreach efforts to convince other developing country members of the WTO to allow the moratorium to expire. They argue that, as more products are traded internationally in digital form, the moratorium has led to growing revenue losses to national treasuries. In the current world of advanced technologies such as 3D printing and cloud computing, many leaders in these countries believe the moratorium has diminished the developing country "advantage" of generally higher tariff levels (than developed countries) for physical goods.

In a recent study, the United Nations Committee on Trade and Development warned that if developing countries do not actively regulate imports of data and software, their ability to control manufacturing and services trade will

Metamorworks/Shutterstock

INCREASED COSTS AND OTHER CONSEQUENCES

The expiration of the e-commerce moratorium could significantly increase costs for companies that sell services and products over the internet such as:

- Internal management
- Dealer coordination
- Customer outreach
- Fulfilling maintenance
- Service relationships

erode. However, the moratorium has become a critical part of the global foundation of the digital economy and is a great example of how the multilateral system can promote policies that foster innovation and growth. Growth in these areas spurs growth in entire economies. Just as the WTO's Information Technology Agreement (ITA), which eliminated tariffs on technology goods, played a fundamental role in spurring growth and deepening value chains in developing nations' services sectors, tariff-free trade in services promote the adoption of new technologies.

The possibility of new, arbitrary trade barriers against the free flow of digital trade is becoming more concrete, particularly in some of these large, influential developing economies. For example, Indonesia has formally added five new six-digit 9901 tariff categories to its tariff schedule for "software and other digital products transmitted electronically." This change will enable the country to legally introduce tariffs of any level on these products (or transmissions) should the existing moratorium expire.

With global cross border data flows reaching $2.8 trillion in 2014, the stakes are high. A new generation of digital trade barriers threatens to be disruptive and costly in the future. To ensure that the services and digital trade continue to expand and fuel economies and employment, we must have multilateral digital rules and a revitalized WTO to enforce them.

A Tariff-Free Internet

It appears the U.S. government is actively devising a negotiating plan to achieve extension of the moratorium on customs duties. Congress and much of the business community have been quiet on the topic, perhaps preoccupied with responding to the set of retaliatory tariffs imposed by the Trump Administration. But to achieve a rapid agreement on keeping the internet tariff free, negotiations to create a high standard e-commerce agreement must intensify and include more engagement from Capitol Hill and industry.

Given the economic impact on the U.S. economy, it is important for Congress, the business community and other stake holders to focus on the significance of establishing permanent international rules of fair and non-discriminatory treatment in the digital trade sector. WTO negotiators have many new business models to consider as they frame discussions towards the next stage goal of a larger, more encompassing digital and e-commerce trade agreement.

The coming six months will be an important time for the tech sector to pay attention to debates and decisions in the WTO. ■

A former Chairman of the U.S. International Trade Commission, Meredith Broadbent can be reached at MeredithMBroadbent@gmail.com.

GUEST BLOG

Megatrend
Iris Biometrics

The biometrics market was valued at just over $12 billion in 2018 and is expected to reach over $69 billion by 2024. That 35.53%, growth rate over 2018 makes it a hot market, standing out as one of the 2019 Megatrends from SecurityIndustry.org.

Identity Goes Mainstream

The identity of the future may be a single credential, or even a virtual certificate that identifies who you are and gives the system the ability to automatically revoke you if protocols are not followed. Frictionless access control is the futuristic concept of free flowing yet secure access to a space. It requires little interaction and does not interfere with users, eliminating the need for an employee to carry a fob or remember a PIN to enter an office.

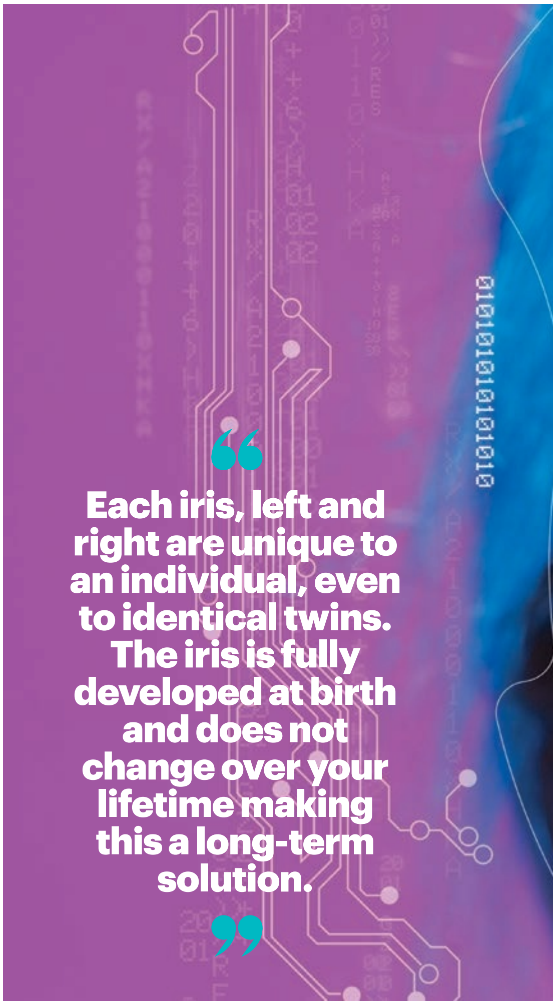
Consumers want convenience, but what about privacy? One of the key trends witnessed in the next generation biometrics market is a paradigm shift in business discourse toward more privacy and fewer security threats. End-users are looking for integrated solutions, rather than depending on conventional methods.

Privacy and civil rights concerns have escalated globally as face recognition gains traction as a law enforcement tool. On May 6, San Francisco voted to ban facial recognition technology. It is the first ban of its kind. The anti-surveillance ordinance signed by San Francisco's Board of Supervisors would bar city agencies, including the San Francisco Police Department, from using the technology since June 2019. Then the *Boston Globe* reported the Somerville City Council in Massachusetts voted to ban the use of facial recognition making it the second city to make this decision.

The California Consumer Privacy Act (CCPA) — passed in June 2018 and effective as of January 1, 2020 — will have a serious impact on privacy rights and consumer protection for the whole nation as the law is frequently presented as a model for a federal data privacy law. In that sense, the CCPA has the potential to become as consequential as Europe's General Data Protection Regulation (GDPR). In July 2018, Bradford Smith, Microsoft's president, compared facial recognition technology to products like medicine that is highly regulated, and he urged Congress to study and oversee its use. "We live in a nation of laws, and the government needs to play an important role in regulating this technology," Smith wrote.

CTA U.S. Senate Event: Iris Biometrics

The majority shareholder for my company EyeLock is VOXX International Corp. They've grown into a worldwide leader in many automotive, consumer electronics and accessories categories, as well as premium high-end audio. Chairman and Founder John Shalam founded Audiovox Corp., the predecessor of VOXX International in 1965. He was instrumental in helping CTA become an active participant in the wireless communications industry, establishing the Wireless Communications Division in 2001, and acting as its founding chairman.



> "Each iris, left and right are unique to an individual, even to identical twins. The iris is fully developed at birth and does not change over your lifetime making this a long-term solution."

CTA held a U.S. Senate visit led by CTA's Jamie Boone. Tom Malone, president of VOXX Advanced Solution Corp., Michael Petrov, PhD and senior technical leader and I presented for two hours that day — educating, demonstrating the technology and answering questions.

Many asked about the privacy concerns for different types of biometrics including facial recognition and iris scans. Iris biometrics is being used everywhere from airports, venues, shopping centers and even by law enforcement. While facial recognition tech has received criticism for being able to pick someone out in a crowd and identify them without them actually giving consent, iris recognition is equally fast and

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economically competitive. During the event, we demonstrated how to create a physical "zone of trust" where the consumer or user must opt in and give their consent by creating the optimal space and distance where it is convenient, frictionless and secure — with privacy at its heart.

How accurate is facial recognition compared to iris? Between 2014 and 2018, the National Institute of Standards and Technology's (NIST) evaluation of 127 software algorithms from 39 different developers found that facial recognition software got 20 times better at searching a database to find a matching photograph. The team found that just 0.2% of searches failed in 2018, compared with a 4% failure rate in 2014 and 5% in 2010.

A key reason for concerns among citizens is the lack of federal regulations surrounding the use of facial recognition technology. Many are worried about how accurate the technology is and if there are biases and misinformation in these technologies. One issue, for example, is the technology has been proven in multiple studies to be inaccurate at identifying people of color, especially black women. Apple states the following about its FaceID security: the probability that a random person in the population could look at your iPhone X and unlock it using Face ID is roughly 1 in 1,000,000 (versus 1 in 50,000 for Touch ID).

Iris technology is on an entirely different playing field. Each iris, left and right are unique to an individual, even to identical twins. The iris is fully developed at birth and does not change over your lifetime making this a long-term solution. Eyelock's False Acceptance Rate is 1 in 2.25 trillion (2,250,000,000,000) for dual eye authentication. And from the market studies referenced earlier, iris recognition is one of the fastest-growing segments among this type of solution. It is easy to use, difficult to forge, and highly accurate. Additionally, there is no ethnic or gender bias.

What's Next?

We can expect much more discussion, measurement and consumer feedback to guide technology providers and lawmakers. Measurements will be handled by private firms, NIST or even DHS. Earlier this year, EyeLock participated in the DHS Biometric Technology Rally, designed to challenge the industry to develop high-throughput biometric systems that meet the requirements of fast and accurate user recognition within identity verification operations, such as security checkpoints.

The 2019 Rally invited providers of biometric (face, iris or fingerprint) acquisition systems, as well as providers of biometric matching systems that achieve defined performance targets for high throughput use cases.

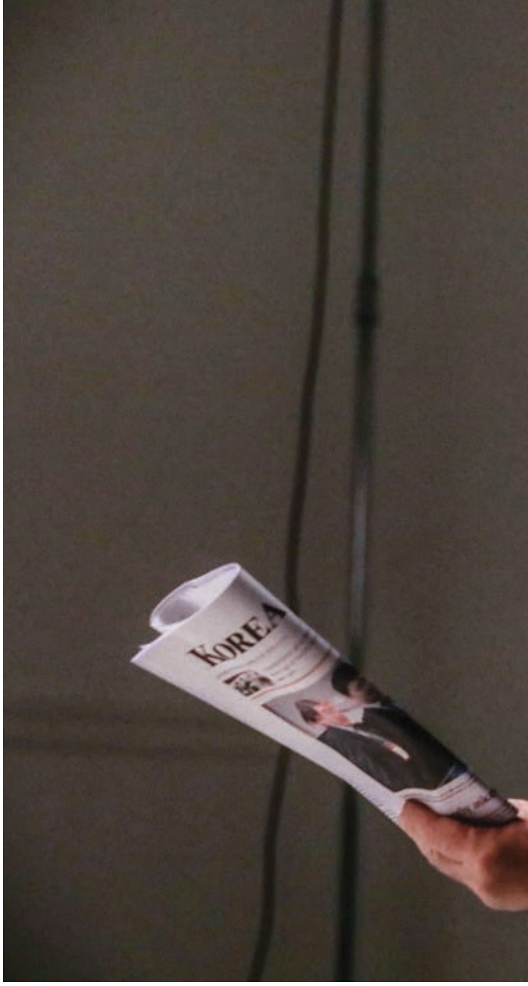
From the consumer point of view, the *2019 Biometric Consumer Sentiment Survey* from Veridium reveals an increased appetite for biometric authentication technology, with 70% of respondents reporting they would like to expand the use of it into the workplace. The main reasons? Speed (35%), not having to remember passwords (33%) and security (31%).

Lawmakers will have to balance these inputs and determine when and how biometric technology will be utilized and regulate the use of the technology. ■

Jeff Carter is the CEO of EyeLock — follow him at @EyeLock or email at jcarter@eyelock.com

POLICY IN ACTION

Mayor Park Won-soon Talks about Seoul: A World Class Smart City



Portrait: Juni Lee

Rolling out a true smart city takes a lot of experience. Born in a village in Changnyeong, South Gyeongsang Province, South Korea, in 1956, Park Won-soon entered Seoul National University in 1975, and shortly after, was arrested for participating in a student protest against the militant dictatorship of President Park Chung Hee. He was imprisoned for four months and expelled from university. Later, he earned a bachelor's degree in history from Dankook University.

Park passed the state bar examinations in 1980 and worked as a public prosecutor in the Daegu District Court in Gyeongsang Province from 1982 to 1983. Returning to Seoul, he launched into private practice as a human rights lawyer defending political activists. In 1991, Park earned a diploma in international law at the London School of Economics and Political Science in the University of London. In 1993, he went to the U.S. as a visiting research fellow in the Human Rights Program of the School of Law at Harvard University.

Back in South Korea in 1995, Park founded the People's Solidarity for Participatory Democracy, a nonprofit, nonpartisan civic organization formed to promote democracy and secure human rights in South Korea. In 2001, he founded the Beautiful Foundation to promote a culture of philanthropy in South Korea. And in 2002, he founded the Beautiful Store, a second-hand store to spread the culture of giving and sharing with others. In 2006, Park founded the Hope Institute, a think tank with the goal of applying policy alternatives based on the ideas of ordinary citizens. Known as a "social designer," Park has dedicated his career to bringing about fresh change. In 2006, his efforts were recognized with the Ramon Magsaysay Award, called the "Nobel Prize of Asia."

Park was elected as Mayor of Seoul in October 2011 as an independent candidate, with the support of the Democratic Party and the Democratic Labor Party. His slogan was "the citizens are the mayor" and he pursued collaborative governance with citizens in the policy decision-making process. He realized the importance of strengthening city-to-city cooperation while tackling common challenges. He assumed leadership responsibilities in government organizations, such as WeGO, an organization to promote e-governance and smart cities, GSEF, an organization to find solutions to social problems through social economy, ICLEI, C40 and more.

He was re-elected as Mayor in June 2014 for a second term, and then again in June 2018 for a third term. He is the longest serving mayor of Seoul in the history of South Korea. He talked with *i3* about Seoul as one of the first smart cities in the world.

Q What makes a city smart?

A The "dynamics of the city" and the "participation of citizens" are the factors that make a city smart. A "smart city" is the product of mankind's agony and introspection on how to make life happier and fuller, and the output of both the city and the citizens by actively realizing and using state-of-the-art technologies. Moreover, a smart city has become the most useful method to enhance the quality of life of citizens and an efficient tool to resolve global urban challenges. Beyond its dominant status as the best global e-government in the world for seven consecutive years, Seoul is now leaping forward as a leading smart city in the world based on big data and new technologies of the Fourth Industrial Revolution.

More than anything else, the voluntary participation of Seoul citizens and the combination of new attempts and innovative challenges utilizing cutting-edge technologies by the public and private sectors are making Seoul's own smart city differentiate itself from other cities. The "Digital Mayor's Office" on one side of my office symbolizes the status of Seoul as a global smart city. It is a smart city digital platform where I can see the status of the entire city at a glance in real time. It is one of the indispensable practices that the world's mayors and delegations learn when they visit Seoul. Professor Susan Crawford of the Harvard Law School highly praised it as the sprout of democracy. It is a representative item of Seoul to

> **“The “Digital Mayor’s Office” on one side of my office symbolizes the status of Seoul as a global smart city.”**

present at CES 2020. I hope many people visit the Seoul booth in Eureka Park and enjoy the charm of the smart city of Seoul.

Q How is Seoul paving the way for other cities to become smart cities?

A Ever since Rutgers University in the U.S. started the Global E-Governance Survey on the major 100 cities around the world, Seoul has never let go of its number one position in the performance of municipal e-government. Seoul is a state-of-the-art city that boasts the world’s best information and communication network where people can enjoy free high-speed Wi-Fi even in moving buses and subway trains. It also has the highest retention rate of smartphone users on the globe.

Based on these strengths, Seoul is now writing a new chapter in the history of smart cities in various areas that are closely linked with the lives of its citizens, such as in transportation, economy and the environment. Among them, the area in great demand and with the biggest ripple effects on the citizens is transportation. Seoul has significantly enhanced the convenience of public transportation through “Seoul’s Intelligent Traffic System” (ITS), Smart Transportation Card and Bus Information System (BIS).

In 2010, Seoul established the WeGO (World Smart Sustainable Cities Organization) to support sustainable urban development and also to narrow the information gap through exchanges and cooperations with world cities for the smart city area. WeGo has members from 177 cities and corporations. Seoul is also supporting other cities by exporting smart city solutions including TOPIS (Transport Operation and Information Service), IoT-embedded LED streetlights, and smart garbage processing systems.

Q How are you using data to provide better experiences for city residents?

A “Big Data,” so-called “the crude oil of the 21st century,” is the key driving force to operate a smart city. The Seoul Metropolitan Government has created the foundation to produce, store, process and utilize big data, and is scientifically analyzing the data and making reasonable inferences. The goal of Seoul is to provide innovative alternatives to solve urban problems and to focus the city’s capabilities in making significant changes to the lives of the citizens.

The most representative case is the late-night bus called “Owl Bus,” which is an innovative scheme for night-time transportation. To determine the Owl Bus’s routes, we analyzed three billion cases of big data (i.e. mobile phone calls). A total of nine routes of the Owl Bus have been designated in the areas with the highest demand for public transportation at night-time. These buses are now responsible for the safe trip home for more than 10,000 people a night.

Moreover, Seoul combined LTE signal data of mobile carriers and the public data of the city government and produced “Daily Population Data” that can be utilized in various areas, for instance, the analysis of commercial districts, marketing activities, welfare, transportation, and other various municipal policies. The Seoul Metropolitan Government is taking a step further to consecutively install 50,000 IoT-embedded sensors across the city and is gathering “city life data” including fine dust, noise, vibration, floating population, UV rays and more.

With the accumulated data, Seoul is creating brand new services, such as Intelligent CCTV, AI taxis, and IoT sharing parking. In this process, the basic philosophy determining the success of smart city policies is “governance” and “openness.” The Seoul Metropolitan Government is establishing the “Data Storage” system where anyone can see and use the public data of Seoul. A total of 528 kinds of the city government’s administrative system data is expected to be stored. I look forward to seeing that big data and collective intelligence create innovative services so that every citizen is allowed to enjoy the benefits from it.

Q Can you talk about sustainability issues and what you are doing to resolve them?

A If the paradigm of “growth” and “development” was at the center of urban civilization in the 20th century, “sustainability” is what determines urban civilization in the 21st century. Seoul has achieved unprecedented rapid growth. However, it is also true that this growth-centered development left us with various wounds of environmental destruction, community

breakdown, economic polarization and other social problems. As the Mayor of Seoul, I took office with the aim of solving these challenges.

Therefore, after the inauguration, my priority was to recover the rights of people which were pushed back and neglected behind "development" and "growth," and to redefine the owner of the city of Seoul as its citizens. Also, various initiatives related to welfare, economy, labor, energy and the like have been implemented closely for the lives of the citizens. Seoul is pushing forward with "urban regeneration" instead of "demolishing" the city. During my tenure, I will significantly increase the amount of public housing by more than 400,000 — 10% more than the OECD average to secure the continuity and sustainability of housing welfare. In terms of energy policies, I will expand the production of new and renewable energies such as solar power, electric/hydrogen-powered vehicles and encourage citizen participation to prepare against energy depletion.

We also are systemizing sustainable development so that it can be applied to all municipal policies. Seoul has established the "Seoul-type Sustainable Development Implementation System" and is running the evaluation on sustainability across the administration. As such, it is no exaggeration to say that sustainability is the beginning and also the end of all policies of Seoul.

Q How did Seoul achieve the rank of the #1 smart city?

A There are three factors that constitute a smart city: smart city infrastructure, innovative companies with cutting-edge technologies, and smart citizens. First, Seoul has a cutting-edge smart city infrastructure.

Korea is the first country that commercialized 5G communications, and you can gain free access to Wi-Fi even in moving buses and subway trains. Seoul is taking a step further to become a "free data city" by 2022, where anyone can use public Wi-Fi free of charge anywhere in the city. Public IoT networks will be expanded, where one can use services such as shared parking. Each citizen will save communications expenses and foreign tourists can also enjoy the same benefit. Second, in Seoul, innovative companies equipped with creative ideas and cutting-edge technologies can participate in the policy-making process. The private sector's big data is a great resource. The public and private sectors can resolve urban problems together. We are making a new value chain in the process by creating opportunities to further develop the already verified technologies and making them profit-making models.

Third, Seoul is actively operating the "digital communication system" that connects the world class smart infrastructure to smart citizens and expanding citizen's engagement. Some of the examples are "Democracy Seoul," a citizen participation policy proposal platform; "M-Voting," a mobile voting system; and "Seoul Online Civil Complaints," an online/mobile window to register and process civil complaints.

Q How does South Korea encourage innovation?

A As the Korean market is highly sensitive to technological changes, it is said that the products that succeed in Korea can succeed anywhere else in the world. As such, global companies regard Korea as a testbed where they can measure the success of their products. For these reasons, they are putting more effort into targeting the Korean market.

Besides, the well-acknowledged big companies in Korea, startups armed with creative ideas and innovative technologies are actively delving into the market to make the city one of the "Top 5 Global Startup Cities." In cooperation with the Korean central government, the Seoul Metropolitan Government is taking a two-track strategy to alleviate regulations that deter corporate activities, while establishing a startup ecosystem where innovative companies can enjoy the new challenges without the fear of failure.

By 2022, we will raise an "Innovative Future Growth Fund" worth 1.2 trillion won to expand the startup investment market and to provide a customized-service for startups from the early-stage growth to the global advancement. For companies at their early stages undergoing difficulties in attracting investment, Seoul makes bold investments in them so that their potential ideas can be realized into products within six months. It provides support throughout the entire process from business feasibility analysis, product design and prototype production, to matching manufacturers with them.

Q What are you most excited to see at CES?

A It is the first time for me, as the Mayor of Seoul and also in person, to participate in CES. I already have great expectations. I know CES is the most reliable testbed where we can measure the success or failure of all the outputs of innovations from around the world, and also a "museum of innovations" where we can witness the products that may lead our future markets in advance.

I am looking forward to the innovations of global companies and their creative passion that I will see there. The innovation and creativity that I will experience at CES will serve as a precious foundation and an insight for me to make Seoul a greater city. ■

CES 2020 Visit the Seoul booth in Eureka Park to see a true smart city.

Joonyoung Kim/Getty Images

By Rachael Watson

FACES OF INNOVATION

Auriel Wright and Kristen Fang of StrattyXCompany

Co-Founders Auriel Wright and Kristen Fang have developed a mobile and automated trading app, which aims to democratize algorithmic trading. Born in the powerhouse of Harvard University's John A. Paulson School of Engineering and Applied Sciences, StrattyX empowers investors with innovative strategic tools. *i3* recently sat down with Wright and Fang to learn more.

Q What was your inspiration for founding StrattyX?

A AW: After working at Goldman Sachs, in the cryptocurrency division — essentially, I was their first cryptocurrency analyst — I saw a large disconnect between people who can code and people who have ideas for trading. I wanted to bring tools to people who can't program or code, to bring them into the 21st century of trading. Eighty-five percent of the stock market is run by machine but only 7% of our world can program, so it's really helping to fill that need.

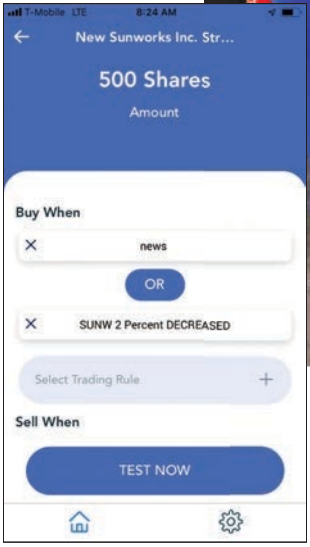
Q What kind of impact do you hope your work will have on the tech landscape and for consumers?

A AW: As a team, we hold ourselves to the standard of "if someone says to jump seven feet, we jump 700 feet." With that in mind, we want to break down barriers and set standards for other people to get validation in the Valley. I'm happy and excited for that. Knowing that we face sexism, ageism, and racism on a daily basis is one of the reasons I'm out here kicking.

KF: We also want to empower everyday investors. We're in a new age of trading where viral stories like tweets and news headlines drive trends in the market — this is something economist Robert Schiller coined "narrative economics." Everyday investors don't have access to tools to protect themselves from volatility in the market and seize opportunities. We aim to level the playing field by giving easy-to-use trading tools to the everyday investor. With StrattyX, everyday users can create, test and automate their investment strategies.

Q What excites you the most about tech?

A AW: I'm looking forward to seeing how different efforts within quantum computing are going to play out for us. We're researching and reading through some interesting papers that underlie elements of our platform and platforms we've seen and considered collaborating with. It's been interesting and very promising on that forefront. In terms of our own tech, we have a proprietary scripting language and I'm very interested in seeing what other applications we can push forward with that. It's been our growing tool in the background that we decided to put up on this platform as our first big push, but we're excited to see what other cool things we can explore and build.



Q What advice would you give to entrepreneurs and women in tech?

A AW: Silicon Valley is a boy's club, but that's not always a bad thing. It's so much easier to be different and to provide value, so try to use your differences as advantages. If you don't fit the traditional Silicon Valley archetype, spend time figuring out where you do fit or even if you are not a fit at all and use that.

STRATTYX
Democratizing Algorithmic Trading
Mobile automated trading tools for everyday investors.
Automated Loss Protection
Historical Testing
Trade on real world events
No Coding Required
Control & Autonomy
www.strattyx.com

KF: Be confident, stand your ground and know your worth. There will be a lot of people throughout your startup and entrepreneurial process that will doubt you, won't believe in what you're saying, will throw cynicism at you and won't believe in your idea. But you have to believe in yourself while taking in feedback from other people and continuing to grow. It's a very difficult process but I've learned how to have more confidence in myself and protect the people I care about, as well as our ideas and core mission. In line with what Auriel was alluding to, find your own network in this space. Create a community where you can really thrive, contribute and learn from others. ■

Courtesy of Strattyx

By Elliot Grimm

GREEN POLICY

Announcing the CES 2020 Eureka Park Climate Change Innovators

Daniel Hertzberg/Theispot.com

For more than 50 years, CES has been the world stage for innovators and breakthrough technologies. The show has established itself as a breeding ground for sustainable technologies and products: thinner TVs delivering sharper images, smart home devices with energy-saving capabilities, sustainable transportation and much more. In its commitment to the environment, the industry has also been growing its focus on technology's ability to solve challenges stemming from climate change.

> **Eureka Park exhibitors are uniquely positioned to reduce the environmental impact by harnessing cutting-edge innovations and ideas that go against traditional thinking and business practices.**

In 2017, CTA announced the CES Eureka Park Climate Change Innovators awards to highlight innovators whose technology will have a meaningful impact on the environment by reducing carbon emissions. As the next generation of entrepreneurs and startups, Eureka Park exhibitors are uniquely positioned to reduce the environmental impact by harnessing cutting-edge innovations and ideas that go against traditional thinking and business practices.

At CES 2020, six winners were chosen by industry experts:

Edgehog: Edgehog's solar panels — with an average 15% higher output than commercial competitors — address local power generation needs from IoT sensors to roof-top solar panels. The bio-inspired innovation lays in the ultra-transmissive cover glass and is agnostic to solar cell innovations. **Booth #52518**

Green Systems Automotives: Green Systems Automotives developed an innovative, connected and integrated Flexfuel conversion device designed and engineered for powered two-wheelers that drastically reduce their greenhouse gas emissions. **Booth #50017**

SUNLEAVS: SUNLEAVS is a smart energy innovation associated with a social network, specifically designed to accelerate energy transition efforts around the world by enabling consumer groups to invest together in solar power generation facilities and consume electricity produced between them. **Booth #50215**

ST Engineering Innosparks Pte Ltd: The Airbitat Compact Cooler is the world's coldest portable evaporative cooler that brings deep cooling to compact spaces. Powered by Reevac™ Deep Cooling Technology, Airbitat is 50% more effective in delivering cool air versus conventional coolers, and 80% more energy-efficient compared to air-conditioning of a similar capacity. **Booth #52502**

Omniply Technologies: Omniply has leveraged years of research in materials science to develop Mekal, a unique solution to manufacturing high-performance and high-resolution electronics, such as displays, sensors for IoT and wearable applications, and micro-controllers, using traditional mico/nano-fabrication methods but in a flexible form factor. **Booth #52513**

RideSVP: RideSVP – The Green Carpool Network connects drivers and passengers to carpool on city-to-city trips in an affordable, social and green way. It's an online collaborative platform where regular people planning to drive out of town register their vacant seats for others to book. **Booth #53553**

Beyond its exhibitors, CES is also becoming more sustainable. At CES 2019, over 1,400 tons of materials and more than 1.7 million square feet of carpet were recycled or reused after the show. All vinyl banners, booth ID signs and aisle signs were recycled — diverting more than 36,000 sq. ft. of material from the landfill. More, CES exhibitors collectively donated more than 312,000 pounds of materials to Goodwill, Habitat for Humanity, Opportunity Village, Teachers Exchange and HELP of Southern Nevada. ■

CES 2020 For more information on sustainability at CES, visit **CES.tech/Green**.

By Jennifer Taylor

POLICY NEWS

Meet Klaxoon

Klaxoon, a French-based company, is revolutionizing how meetings are conducted using interactive, digital tools. Klaxoon's proprietary digital platform has helped thousands of companies shift from traditional information-sharing only meetings to inclusive,interactive,decision-making meetings. Participants connect from their devices to engage in activities such as surveys, brainstorming and live messaging.

"I created a company built around teamwork and efficiency with the best tools to improve meeting collaboration," says Matthieu Beucher, CEO of Klaxoon. "I was sitting in meetings that were not very efficient and took too much time. We didn't make decisions and they lacked creativity."

Klaxoon, a CTA member, attributes much of its success to its decision to exhibit at CES 2016 in Eureka Park where each year, over 1,200 startups showcase their innovations. And since 2012, more than $1.5 billion has been funded in Eureka Park startups. And French President Emmanuel Macron, also attended CES 2016.

It has grown from a startup with fewer than 10 employees into a multinational tech company with 5,000 client companies in 120 countries. BMW, Deloitte, Dior, Harvard University, Siemens, McDonalds, PwC and Verizon are using Klaxoon's technology to conduct more productive meetings that drive innovation and give everyone a voice.

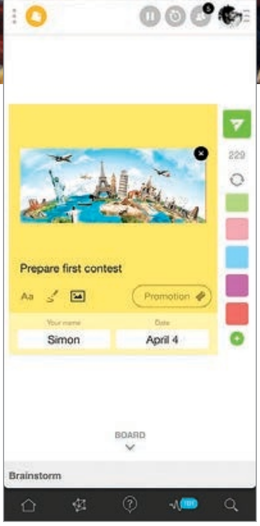
"Klaxoon's solutions motivate everyone in the room to have a say, be anonymous, and on equal footing, so everyone can offer their ideas and participate — which ultimately drives innovation and increases employee engagement," says Charles Kergaravat, head of international marketing.

Klaxoon's CES Journey

Prior to CES, Klaxoon spent two years designing and testing its product. One of Klaxoon's first customers encouraged the company to apply for the CES Innovation Award, which Klaxoon won in 2015. Winning this award marked the beginning of Klaxoon's engagement with CES. During Klaxoon's first year at CES 2016, thousands of people visited its booth staffed by just four employees. "Eureka Park was so huge and unexpected," Beucher says. "We were so far away from our well-known environment, when we arrived, we knew we had made it."

What was most valuable to the Klaxoon team was the feedback they received about their product and the deeper understanding of their customer's needs. "We made a giant leap at CES in terms of gaining business, as well as in marketing and learning how to best present our product."

Klaxoon returned to CES 2017 with a larger exhibit space in Eureka Park — and additional staff — to unveil the second generation. "People were gravitating towards us because our booth was buzzing with activity," recalls Kergaravat. "From there it was a natural step to say, 'we've grown out of the 10-by-10 space in Eureka Park and now we need to go upstairs."



Klaxoon's platform allows meeting participants to engage in surveys, brainstorming and live messaging.

Klaxoon moved to the main exhibit floor, evidence that it has grown from a startup into a global provider of revolutionary meeting solutions. At CES 2019, they launched the bold Klaxoon *Teamwork Tour* onboard a hot pink semi-truck that served as a new workspace prototype. Starting in Las Vegas, the team visited 16 cities and met with thousands of workers over 11 weeks to discuss the future of work, new ways to collaborate with digital tools, and how to facilitate meetings and foster teamwork.

For the past five years, Klaxoon has chosen CES to unveil its new innovations to the global tech industry. At CES 2020, they will introduce their newest product, the TEAMPLAYER — a CES 2020 Innovation Award winner — the fourth CES Innovation Award Klaxoon has received. ■

Eureka Park Marketplace

Airbitat Compact Cooler

Powered by Reevac™ Deep Cooling Technology.

Airbitat delivers unparalleled cooling performance that is 50% more effective versus conventional coolers, in every environment. Ideal for cooling open spaces, Airbitat Compact Coolers are powerfully cool even in the most challenging environments from tropical to arid climates. Our unique Reevac™ Deep Cooling Technology ensures that Airbitat is always 50% more effective in delivering deeper cooling than conventional evaporative coolers, and 80% more energy-efficient than air-conditioning.

airbitat.com

EP Booth #52502

Blue Eclipse

Simply Connect Cars, Garages and Homes

Blue Eclipse provides a do-it-yourself, universal control for car doors, garage doors and alarms, using existing remotes. BluRemote is a patented, self-powered robotic system that uses the touch of a robotic finger to control any car, garage or home alarm, following a short and simple process to train the remote.

blueeclipse.co

EP Booth # 51133

Caregiver Smart Solutions

Caregiver Smart Solutions Enables Aging in Place.

Caregiver Smart Solutions "Let them Age in Place" kit enables loved ones to live in their homes while providing peace of mind to family. Consists of tiny, non-intrusive sensors placed discretely in the home tracking habits: bathroom use, eating patterns, proactive fall detection with real-time data insights shared on an app.

caregiversmartsolutions.com

EP Booth #51527

intelashelf
Transform your furniture into a Power Charging Platform
A NEW Way To Charge

D3 Products

Transform your Furniture into a Power Charging Platform.

Intelashelf slides under cushioned furniture, charges multiple electronic devices simultaneously while pairing electronic devices to stream music and work in parallel with smart home assistant products. 33-watts of charging power consolidated into a portable furniture platform offering two USB ports, a 15-watt triple-coil wireless charger and speakers offering astonishing sound.

D3products.com

EP Booth #50929

DroneInch

Agriculture's First Drone Solution with Business Workflows.

DroneInch builds software for remote autonomous flight of inexpensive off-the-shelf drones for customers in farming, mining, construction, public safety, manufacturing facilities, power plants, and more.

droneinch.com

EP Booth #51107

Hi Auto

Audio-Visual Speech Enhancement that Eliminates the Most Challenging Noises.

Hi Auto is a deep learning software only system that leverages a speaker facing camera and a single microphone for more accurate speech recognition and clear speech enhancement. The system eliminates the most challenging noise sources as multiple speakers, radio, sirens, and heavy rain. What Dolby has done for music and movies, "Hi Auto" is doing for the human voice. Accept no substitute. When it comes to making your voice heard…insist on "Hi Auto."

hi.auto

EP Booth #51701

Hi-Cooler Company Limited

Personal Mobile Eco-friendly Air-Con-Purifier

HICOOLER is Ultra-Mobile Air-Con-Purifier to be carried anywhere and be used anytime for personal air conditioning with fresh air. The era of outdoor air conditioning is not a dream any more but a reality. HICOOLER will not worsen the global warming of the Earth because of its zero carbon footprint.

hi-cooler.com

EP Booth #51241

Idrive, Inc.

Intelligent Driver Monitoring Technology

World's most intelligent AI dual camera system with built-in powerful proprietary neural network including features like: Facial Recognition, Distracted & Drowsy Driving Detection, Safe Distance Warning, Seatbelt Detection, Accident Prediction and more. idrive's AI Cam puts real time reports and actionable intelligence in your hands.

driveglobal.com

EP Booth #51114

Kwit

Kwit, for a Smoke-Free Future

Cigarette smoking is the leading preventable cause of death. Without help, smokers have less than a 5% chance of quitting. That's why we created Kwit, leveraging digital therapeutics against addiction. Kwit is an app that's five times more effective in helping smokers become non-smokers for the rest of their lives.

kwit.app/en

EP Booth #50041

Luszol

Make your Building Smart, Resilient, and Responsive to External Environments with Luszol's Products and Services.

Resihub is an energy management system that integrates with smart infrastructure to make buildings responsive and resilient.

luszol.com

EP Booth #53164

Mark/Space

Retro-Gaming on your Phone, Tablet, and Television!

Project Argon offers an ever-expanding library of classic games and homebrew hits that play on the Android and Amazon devices you already own. Focused on 80s and 90s cartridge-based console gaming, we are currently compatible with Atari Lynx and Vectrex. Additional platforms coming soon.

markspace.com/retro

EP Booth #53151

Impossibly Thin. Infinitely Useful.
ohsnap

ohSnap Inc.

Stop Settling for Mediocre Phone Accessories.

Ohsnap is the phone grip that doesn't suck. Phones are no longer properly physically designed to perform the multitude of tasks we now use them for. Ohsnap adheres to the back of any phone or case giving the user enhanced utility and comfort. Features include: hand-grip, rotation, multi-angle stand, magnet, car-vent mount, sliding, fidgeting, wireless charging compatible, 3mm thin, and even a box opener.

ohsnap.com

EP Booth #53168

Eureka Park is the flagship destination at CES where more than 1,200 startups share ideas, launch new products and services, make business deals and get media coverage. Many venture capitalists and investors also come to Eureka Park looking for the next unicorn.

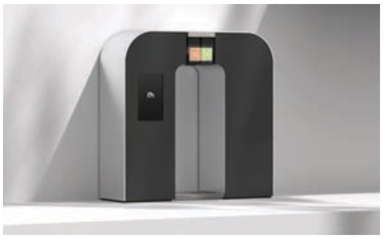
Pokit Innovations

Pokit PRO Frees You from the Bench.

Pokit PRO is an all-in-one multi-meter, oscilloscope and logger with unprecedented portability, accuracy and versatility. The product connects wirelessly to the Pokit smartphone app to measure a wide range of parameters, including voltage, current, resistance, capacitance and temperature. It also supports features like a smart watch app and scope measurement functions.

pokitmeter.com/pro

EP Booth #53373



Rocean

Free Your Water

Rocean One is a smart, sustainable device that connects directly to your tap allowing you to enjoy filtered, carbonated, and flavored/enhanced water at the push of a button. Save time, save money, and help eliminate plastic bottle waste with this convenient solution that's good for you and our planet.

rocean.com

EP Booth #50721

Roybirot

Meet Roybi Robot: The World's First Smart Toy that Teaches Children Up to Seven Languages and STEM Skills

Roybi Robot is an award-winning educational device that teaches your child based on their pace and interests. With over 500 exciting lessons, it's everything your child needs to succeed in the palm of their hand. Roybi Robot was named by CNBC as one of the world's 100 most promising startups to watch in 2019.

roybirobot.com

EP Booth #50906

SmartMimic

We are Building the Future of Security on the Go. "One-Click, Peace of Mind."

Always connected, always secure with no monthly data fee. Smart Mimic provides instant security on the go solutions for your daily life. Make any place as secure as your home with Mimic Go, the world's first security on the go device. Secure yourself, your family and valuables anywhere, anytime.

smartmimic.com

EP Booth #52333

StayTouch

Making Connections Meaningful With Just a Touch

Have you ever forgotten a person you met yesterday or at a conference last month? Or why you added someone on LinkedIn? Or lost a business card? The StayTouch app solves this problem and more while bringing value to your contacts and putting you in control — Recommended for business and personal use.

staytouch.com

EP Booth #52951

Steri-Write

A Clean Pen Every Time!

Steri-Write is a new product that interrupts the pathway of infections on shared writing instruments by providing a clean, germ-free, sanitized pen or stylus to each user. Steri-Write utilizes powerful UV-C germicidal LEDs to kill bacteria and viruses found on shared writing instruments. Every health conscious business will benefit from Steri-Write's ability to disrupt the spread of communicable diseases.

steri-write.com

EP Booth #51326

TacSense

Beyond Our Sense of Touch

TacSense has developed the world's most sensitive and flexible tactile sensing technology, known as the Flexible Iontronic Sensing technology (FITS). It utilizes proprietary ionic materials to establish an ionic-electronic interface in respond to mechanical stimuli. It provides real-time high-quality noise-immune tactile/force signals in a mechanically flexible, optically transparent, and ultra-thin package.

tacsense.com/

EP Booth #50521

Terawatt

You Want to be Great at Your Job. We Make it Happen.

Terawatt is democratizing access to career coaching by hosting virtual, group courses taught by vetted instructors. At Terawatt, because all participants are virtual and students split a coach's (often-times expensive) hourly rate, busy professionals can learn from the best coaches for a fraction of a coach's market one-on-one rate.

goterawatt.com

EP Booth #52948

TexEnergy

Portable Off-Grid 12V Wind Turbine

The Infinite Air 12V harnesses the wind to generate instant power direct to a device or a battery. The Infinite Air 12V has precision designed blades that maximize torque and power, making it very efficient for its size. It is light, completely portable and packs away for easy storage.

texenergy.com

EP Booth #52501

U WIGO + U NIV3RS3

U-WIGO

U-Wigo+U-Niverse, Smart Automation System

U-WIGO is a smart HUB that integrates Internet of Things and artificial intelligence technology to control infrared, Bluetooth and radiofrequency devices, along the UNIV3RS3 ecosystem (light switches and dimmers, outlet sockets, door locks and so on), allows you to completely automate your home in a fast, easy and affordable way.

u-wigo.com/

EP Booth #50729

By Jeremy Snow

TECH HUB

The Future's Future: Inside CES' Eureka Park

Visit the Sands Expo at CES and you'll be transported to a world of innovation and entrepreneurial spirit. At Eureka Park, CES' dedicated area for more than 1,200 startups, young businesses from all over the world come to launch new products, services or ideas, form new partnerships, get funding and make new acquisitions.

OWL
benjilock by Hampton
ROYBI
bluarmor

For over a decade, Eureka Park has served as the global stage for startups, attracting companies like Indiegogo and Kickstarter. This section of the show floor attracts over 2,000 venture capitalists and investors; and over 6,300 members of the media.

Eureka Park's popularity has made it an essential stop at CES. Investors come to Eureka Park to find their next unicorns. Global media come to look for their next story. Corporations come to look for partnerships and acquisitions. And startups hope to connect with investors and funding.

Eureka Park is a global event that draws over 50 countries from six continents including:

- Belgium
- Canada
- France
- Great Britain
- Holland
- India
- Israel
- Singapore
- South Korea

Shark Friendly

If you're looking for proof of the success of Eureka Park, look no further than the reality TV show *Shark Tank*, which has featured many exhibitors. One of the first was **Benjilock**, an easy-to-use padlock that opens with your fingerprint. CEO Robbie Cabral participated in a *Shark Tank* casting call at CES 2017, got on the show and had Kevin O'Leary invest in his company.

Other Eureka Park alumni followed suit, including smart LED light bulb company **Ilumi**, who received a deal from Mark Cuban, and the feline DNA testing company, **Basepaws**, who also invested with O'Leary.

While not every business may find its way to TV fame, others find ways to connect with investors and the media. So far, Eureka Park exhibitors and alumni have received over $1.5 billion in funding since 2012.

Look for other industry leaders on the CTA Startup Stage, where you can find entrepreneurs and experts discussing diversity and inclusion, tech trends and business tactics. ■

CES 2020 Eureka Park (Sands, Hall G) is the premiere place to see the hottest startups and new tech innovations.

A FEW EUREKA PARK 2020 EXHIBITORS

● **BluArmor:** A must for any motorcycle rider, this high-tech helmet offers personalized cooling to keep your rides more comfortable. BluArmor easily clips onto any helmet, flowing cool, dust-free air into your face.

● **HeartHero:** Innovative tech can save lives like this "next-generation" defibrillator. Easy to use, portable, and powered by store-bought batteries, this device allows anyone the chance to save a life in the case of sudden cardiac arrest.

● **Meeting Owl:** Ever call in to a meeting and feel like you weren't really there? Owl Labs' Meeting Owl provides a solution, using its 360-degree conferencing camera to capture video and audio for a near face-to-face experience. By automatically shifting the camera to focus on whoever is speaking, the Meeting Owl creates a fully automated and immersive experience.

● **Roybi:** This tiny, education-focused robot is aimed at young children. Complete with a quirky alien-like body, Roybi teaches kids through games, songs and lessons, improving their vocabulary, reading skills and mathematics.

● **Wazo:** This all-in-one smart home safety hub may be no bigger than a lunchbox, but offers everything you need to protect your home. The device connects to other IoT devices — including security cameras — to identify objects and intruders, making your already smart home even smarter.

Business i

92

Forward Strategies

Artificial Intelligence Offers a Smarter Approach to Business

STRATEGIES TO GROW THE INDUSTRY

Insights to help improve the bottom line

88 C Space **92** Forward Strategies **93** By The Numbers **94** Retail Strategies **96** Advice for Entrepreneurs **97** Tech Tactics **98** CT Reports **102** Market Beat

MF3d/Getty Images

C SPACE

C Space Escalates Content and Tech Connections

At the ARIA in Las Vegas, you see "activations" and hear "storytellers," rather than "exhibits" and "speakers." You encounter "multi-modal engagements," not mere "demonstrations." Ultimately, C Space — the brand marketing and entertainment event at CES 2020 — reflects the evolving alliances taking place between content and the emerging delivery platforms, on display elsewhere at CES.

The confluence of tech and brands has been growing each year since C Space debuted in 2015. At C Space, advertisers, marketers, technologists and global brands are converging to demonstrate how technology innovation is driving industries forward. The C Space programs examines how brands are leveraging big tech trends such as artificial intelligence (AI) and virtual reality (VR) into their strategies.

More than 33,000 marketing and advertising executives are expected to take part in the C Space program, and upwards of 60 companies (including first-timers Target and iHeartRadio) are exhibiting. Many of the exhibitors will hold court in "activations," a new approach to presentations that aren't quite demonstration booths nor are they private meeting rooms.

As for "storytelling," that's the dozens of targeted presentations from top media and marketing executives, such as WPP CEO Mark Read, Procter & Gamble Chief Brand Officer Mark Pritchard and Condé Nast Senior VP-Marketing Teal Newland. (See sidebar for more C Space Storytellers.)

C Space also encompasses more conventional keynote speeches, open to all CES attendees, such as insights from Linda Yaccarino, chairman, advertising sales and client partnerships at NBCUniversal. Although Yaccarino's portfolio includes the company's entire television portfolio (two broadcast and 17 cable networks plus more than 50 digital properties), her remarks are expected to focus on Peacock, NBCU's new streaming service due to debut this spring.

Quibi, a new mobile-oriented streaming service, will also be in the spotlight, when CEO Meg Whitman and Chairman and Founder Jeffrey Katzenberg describe their vision for the media/tech venture.

Unilever CEO Alan Jope and Chairman, Co-CEO and Founder of Salesforce Marc Benioff, will be interviewed by MediaLink Chairman and Founder Michael Kassan who will ask the consumer product giant's top executive about his outlook for the evolving ecosystem.

Envisioning Consumer Experiences

Karen Chupka, CTA's executive vice president, CES, focuses on the increasing presence of non-tech companies at CES as evidence of their increasing recognition that they must embrace new platforms to reach their customers. She says that 87% of Fortune 100 companies now attend CES.

"C Space is where leaders from entertainment brands and the ad community come to build the future of consumer experiences," Chupka says. She also points to growing attention to special market segments — some of them massive — that are part of the C Space initiative.

For example, The Female Quotient, a consulting firm focused on women in business, will sponsor the FQ Lounge, described as a "Home of Equality," as well as programming sessions. Shelley Zalis, CEO and founder, says, "Study after study shows women who support women are more successful in business."

Chupka says the FQ Equity Partner role — focused at C Space — is emblematic of CTA's goal to "bring underrepresented communities" into CES and "to integrate more voices from all communities."

SPACE
CES
TECHNOLOGY
MEDIA

C Space Storytellers panel. Below: MediaLink's Wenda Harris Millard speaks with YouTube's Robert Kyncl.

Top: UPI/Alamy

Meanwhile, the growth of C Space has triggered rearrangements of several traditional CES programs. The gaming and sports technology conference programming and exhibits have moved into C Space. "That's an important addition because so much of what's happening in sports tech is related to advertising," Chupka explains, noting that categories such as esports are deeply involved in brand activation.

Nonetheless, esports (competitive video games that function much like traditional sports, with leagues and stadium-sized games) will also be on display at the Sports Tech section of CES, reflecting its alliance with NASCAR, the NBA and other platforms. And esports exhibitors will also participate in CES's traditional Gaming Marketplace.

Also moving to the C Space venue is the Digital Hollywood conference, which pioneered the media/tech examination.

> **"C Space is where leaders from entertainment brands and the ad community come to build the future of consumer experiences."**
>
> Karen Chupka,
> CTA's executive vice president, CES

The C Space agenda also will feature a session on Politics and Media, examining the "intersection of marketing tech and political activity."

C Space also includes conventional panel discussions, such as "Brands Consumers Trust" by the Edelman agency and "Technology as a driver for Agency Evolution." Another session will examine the challenge of "Creativity vs. Data," exploring the role of chief marketing officers and how they seek to balance creative and analytics segments of the business.

Reflecting new technology available to media/marketing companies, C Space has added topics such as "Multi-Modal Engagement," with sessions devoted to use of facilities such as "smart speakers." For example, "Modev@CES" is a day-long session about strategies for voice-enabled commerce, including specific content for Amazon, Google, Siri, Bixby and other Internet of Things platforms. The event will show examples from appliances to automotive applications.

Why Media/Marketers Find Value

Amanda Turnbull, SVP and executive producer at WarnerMedia Ad Sales (formerly Turner Marketplace), has been involved with C Space since its beginning. She characterizes the separation from the main CES hub as "a powerful space where you are witnessing first-hand what's next."

"I couldn't imagine a better backdrop for advanced advertising media conversations," she adds, noting that C Space has enabled the media company to get closer to agencies and brands "through

SPACE
CES
hulu

C Space Storytellers: Hulu at CES 2019.

both easily accessible and engaging meeting spaces, as well as visual storytelling activations about our brand portfolio and ad solutions."

At CES, WarnerMedia will emphasize its creative and technology resources "to drive culture and meaningful connection," Turnbull says. "We will lean into the technological aspect to that connection," she adds, citing ad solutions and a showcase for "our ongoing relationships with [AT&T's advertising and analytics division] Xandr, and how that benefits brands."

Turnbull also cites the development of "partnerships across the various sectors of our business" as a value of WarnerMedia's C Space activity. For example, the sales division is looking for "partners who want to engage with a solutions-based ad organization with a breadth of brands across entertainment, kids, news and sports."

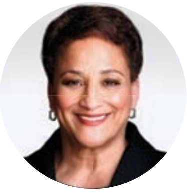
Fred Jacobs, founder and president of Jacobs Media Strategies, brings broadcasting executives to CES each year to assess the media technologies that compete with radio and TV and also to preview automotive developments, which account for a sizeable portion of their advertising inventory. Executives from these groups also drop into C Space, as Jacobs put it, "because of the brands that have staked out key real estate.

"In our world, seeing what Spotify and Pandora are up to is important to understanding how the audio business is evolving," Jacobs explains. He says, "Broadcasters love the conversation with marketers and other key players from some of the biggest brands in the business. The radio broadcasting business has a big stake in national and network ad sales. C Space is a place where they can do business and network."

"We are excited to see where 'voice' is moving," he notes, alluding to voice-activated devices. He says, "Amazon and Google have a major presence at CES and have partnered with other brands. We love to see audio continue to make strides." Jacobs says, "C Space is a great example of how some of the most important thought leaders in technology come together to exchange ideas. You get a lot of business accomplished at C Space." ■

GETTING AROUND C SPACE

The CES 2020 C Space Storytellers include:



JO ANN JENKINS, CEO of AARP, who will talk about "Smashing Stereotypes: How People 50+ Purchase and Use Tech."

ANDREA MALLARD, Pinterest CMO, will interview a top Hewlett-Packard executive, focusing on challenges of millennials that are looking for ideas on how to nurture a healthy and inspired life.

TEAL NEWLAND, Condé Nast's SVP of marketing, distribution and new platforms, will explore the changing media consumption landscape focusing on how digital brands "work in tandem" with their print counterparts.

SIR MARTIN SORRELL, executive chairman of S4 Capital and formerly founder and CEO of WPP plc, the world's largest advertising and PR group, examines how "true digital disruption requires decisive change management."

ANDRE STAPLETON, Amazon Music's U.S. head of label relations, looks at "A New Era of Music: HD Streaming."

Other sessions include "The Future of TV" (organized by Innovid), "Smart Entertainment" (Deloitte), and the "Entertainment Summit" (*Variety*), which includes a discussion of "Zeitgeist Storytelling in the Digital Age."

CES 2020 Most C Space sessions are based at the ARIA Hotel, beginning with "CMO Insights" on January 6 and continuing through January 9.

By Gary Arlen

Les Emmerdeurs
Sobreviví
Sacred Games

C SPACE

Global Streaming goes Multilingual

Unless you're in a dedicated pursuit of original streaming video content, you may have missed *Les Emmerdeurs* on YouTube Premium. The new show is part of the made-for-streaming content roster being produced in various languages for global viewers, including audiences in Asia, Latin America and Europe.

In other words, digital video is not just in English. Although North America is the fourth largest market for video streaming and downloading, according to an eMarketer analysis, digital video distributors are accelerating original content worldwide. eMarketer estimates that in 2020 there will be 1.5 billion digital viewers in the Asia-Pacific region; 493 million in Europe; and 298 million in Latin America. North America has about 260 million viewers, followed by the Middle East/Africa with 183 million. eMarketer foresees 13% global growth in digital viewership during the next three years, with 17% growth in Asia-Pacific — about triple the expected growth rate in North America.

The focus on digital video globalization comes as streaming video outpaces traditional movie-going. An Ampere Analysis report concludes streaming revenue surpassed theatrical revenues for the first time in 2019: $30.6 billion for digital video versus $22.6 billion at box offices.

As global streaming goes multilingual, everyone is looking for content. In addition to U.S. streaming brands, international providers, notably China's Tencent Video and Baidu iQiyi, France's myCanal and India's Hotstar and JioTV, are backing original content to feed their own pipelines.

Aggressive but Cautious

Production deals are everywhere, often in very creative forms. Netflix struck a deal with Italy's Mediaset to co-produce and co-finance seven movies to be made by Italian independent filmmakers. The movies, available worldwide on Netflix next year, will be shown on Mediaset broadcast TV channels a year later. "Great stories can come from anywhere and be loved everywhere," Netflix CEO Reed Hastings says.

Sacred Games, a thriller produced in Hindi, is the first Netflix original series from India. The series has been subtitled into 20 languages, available in 190 countries. Netflix has launched a European anthology series *Criminal*, which involves co-productions from the United Kingdom, France, Spain and Germany. Other streaming video providers are equally aggressive. YouTube Premium launched Sobreviví, its first Spanish language original series in 2019, featuring Sofía Niño de Rivera, a Mexican comedienne.

Margie Moreno, head of YouTube Originals for Latin America, says Spanish programming is "one of our priorities in international expansion," noting Mexico is one of YouTube's top three markets. The deal to create "Sobreviví" came after YouTube acquired rights to stream Gael García Bernal's Mexican heist thriller "Museo." YouTube says the Spanish-language deals meet its global strategy for original, culturally relevant content.

YouTube has also launched *Próxima Parada* (*Next Stop*), a Portuguese travel series. In France, YouTube Premium backed the comedy *Groom*, and *Les Emmerdeurs* ("Troublemakers"), a World War II drama. YouTube's chief of global original programming Susanne Daniels says that plans call for creating original premium content in Japan, Mexico and India.

And in China, Tencent produced the drama *Candle in the Tomb*, and the historical romance *Rule the World*, among a slate of original shows. Baidu is supporting original programming for its iQiyi video-steaming platform, which attracts 421 million monthly viewers. And Alibaba's Youku video-streaming service features series such as *Day and Night*, produced with Netflix — the first Chinese language series with global distribution.

Original programming in polyglot languages has exposed many viewers to local/regional streaming media. Now, the experts are waiting to see if global audiences will embrace the new content options that streaming offers. ■

Left to Right: Courtesy of YouTube (2), Courtesy of Netflix.

FORWARD STRATEGIES

AI Offers a Smarter Approach to Business

Across the board, consumer technology leaders love to emphasize products that feature cutting-edge aesthetic designs. But thanks to the growing impact of artificial intelligence (AI) technology: It's what's inside that counts. With over 20.6 billion devices now connected according to Gartner, and an estimated 1.7MB of data being created every second for every person on earth, you can't judge a consumer tech product by its cover. This also explains why over 80% of companies now see AI-based ventures as a strategic imperative, per Boston Consulting Group.

The predictive insights these solutions offer help product designers provide end-users with more unique (and personalized) features. But they also allow businesses to make smarter decisions, with the forward-thinking data that will become crucial to anticipating customers' needs in coming years. With less than 25% of organizations having started down the path towards achieving self-awareness, it bears reminding. If you haven't started exploring the possibilities already, the time to begin implementing smarter solutions is today.

AI and Machine Learning

Tech tools get smarter the more data they ingest and are helping rapidly transform entire industries. From health care, banking, and retail to insurance and transportation, industries are being upended. AI-powered solutions allow firms to rapidly digest the mountains of customer data they're collecting and translate it into actionable business strategy. These performance-enhancing tech tools allow for huge gains in productivity and process improvements including the ability to free employees from routine chores to focus on more high-value tasks.

The market for AI-powered tools will top $190 billion globally in the next five years.

Predictably, manufacturers are leveraging these high-tech tools to detect flaws too minute to see before products leave the factory and apply deep learning across industrial operations to improve efficiency and output at scale. Likewise, distributors are using these advancements to more efficiently manage inventory stock and fulfilment and make smarter decisions at both the warehouse and product aisle level. High-tech retailers were among the first to embrace AI technology, using it to tailor messages and pricing strategies to individual shoppers; provide customized offers and discounts; and replace generic search and support functions with personally contextualized conversations.

To put things in perspective: The market for AI-powered tools will top $190 billion globally in the next five years, and over 75% of commercial enterprise applications are expected to use smart capabilities in the near future. More than half of all businesses say investments in these technologies will be the most significant ventures they'll pursue this year, according to IDC. Meaning that for all the stream-lining, optimizing and cost-cutting that AI promises to help organizations achieve: It's also driving growth today. That's why eight in ten leaders cite it as a transformative technology that boosts productivity and creates job opportunities while bolstering the bottom line.

Your Smart Upgrade

AI is rapidly becoming commoditized and enjoying more widespread availability. Many software providers now offer off-the-shelf, turnkey solutions for grabbing mission-critical intelligence in real-time from virtually any data source. As a result, many providers can draw on dozens of past projects and case studies to provide simple grab-and-go templates to use as a starting point to speed up development of custom solutions. Companies can mix and match entire suites of cost-affordable AI tools to help drive profit and productivity gains in a matter of weeks.

With data now the new basic building block of business success, the future belongs to those organizations who can most rapidly monitor and decode the signals that the marketplace is sending and translate those signals into smart business strategies. ■

MF3d/Getty Images

BY THE NUMBERS

The Ringing Future of Smart Home Technology

From the technicolor robotic vacuums of The Jetsons to Tony Stark's AI-controlled Malibu home in *Iron Man*, smart home technology has been inherently linked to the American cultural vision of the future and the innovation it brings. Now that 2020 is here, the growing advancements and popularity of smart home technology are making this vision a reality. According to a CTA study, nearly 70% of U.S. households currently own some form of smart home technology.

In its recent study *Exploring the Smart Home Ecosystem: A Segmentation Analysis*, CTA polled thousands of U.S. consumers to identify consumer ownership trends, purchase intent, and motivators and barriers to smart home technology ownership across different product categories, including audio/video, home networking, home security, energy management, lighting and other technology (smart remote, smart robot vacuum, etc.).

Here We are Now, Entertain Us

Audio and video devices maintain the greatest prevalence among U.S. households with 56% of respondents indicating ownership of one of these products. Home networking and home security are the second and third most owned products, respectively.

Among the products included in the survey, smart entertainment devices are the most commonly owned smart audio/video device in U.S. households. In fact, 45% of U.S. consumers own a smart entertainment device which include internet-connected streaming devices like the Apple TV or Roku, home gaming consoles, and DVD/Blu-ray players.

Beyond smart entertainment devices, 25% of U.S. households own smart speakers with a voice assistant. Altogether, audio/video products enjoy low costs and ubiquity, which address the top purchase motivator: convenience.

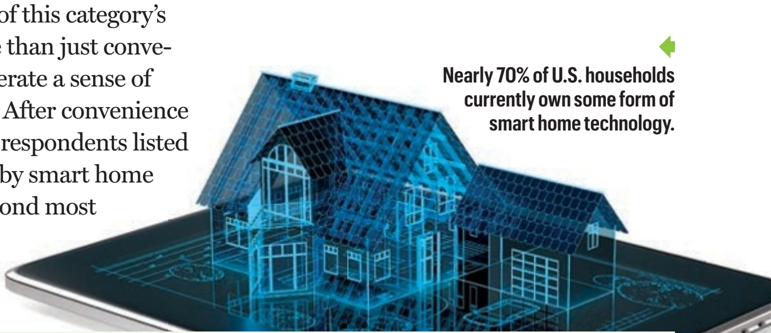
Home Securing Peace of Mind

While home security products presently rank third in prevalence among U.S. households, survey respondents identified this category as their top choice in terms of 12-month purchase intent. In particular, one-third of U.S. consumers plan to buy smart home security technology in the next 12 months.

Rising interest in home security products may be the result of this category's ability to address more than just convenience, but to also generate a sense of tranquility for owners. After convenience at 67%, 58% of survey respondents listed peace of mind created by smart home technology as their second most common purchase motivator.

Video doorbells, internet-connected cameras and smart smoke/carbon monoxide detectors appeared as the top home security products for purchase intent. CTA estimates a 16% increase in shipment revenues for smart doorbells from 2019 to 2020, which will coincide with a projected 13% decrease in their wholesale price in the same period.

This reduction in wholesale price will aid video doorbells in overcoming one of the two most common barriers to purchase for smart home technology as indicated by respondents: cost. Both cost and finding time to focus on specific smart home technology were named as the two major challenges to purchase in survey responses. To mitigate these barriers, manufacturers must help consumers understand the value smart home technology can bring to their daily lives. ■

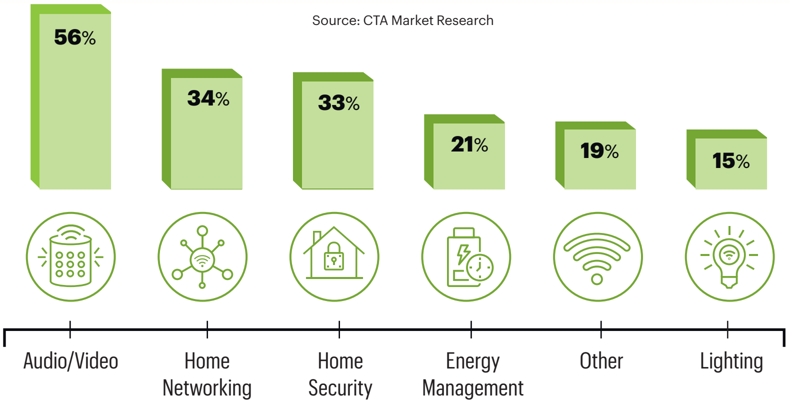


Nearly 70% of U.S. households currently own some form of smart home technology.

Viaframe/Getty Images

U.S. HOUSEHOLD OWNERSHIP OF SMART HOME TECHNOLOGY CATEGORIES

Source: CTA Market Research



By Steve Smith

RETAIL STRATEGIES

Top Retail Groups Ask 'What's Next' at CES

The country's leading retail buying groups are gathering once again in Las Vegas for CES, to check out emerging new categories for 2020, as well as networking with existing vendors, and possible new ones.

Retail group executives say the connected home, smart appliances, 8K TVs, and the rollout of 5G will be hot commodities at CES, along with a couple of surprises, no doubt. They believe their independent retailers and installers, with their expertise, should sell these categories profitably as they roll out.

Nationwide Marketing Group

Nationwide created its own Connected Home Division and began a partnership with AT&T to offer smart home services last year. Tom Hickman, president and chief member advocate, says, "This will be an inflection year for [the connected home] and for our dealers." But he cautioned there is no shortage of vendors offering connected products. He says, "You can go to a custom integrator for a great experience but there isn't a great mass experience at retail."

Hickman says Nationwide's Connected Home and AT&T effort will change the retail experience. "It's a huge opportunity. We offer solutions for independent retailers that put it all together. That's what Nationwide is focused on delivering in 2020." And he adds, "We have to tell [consumers] stories, why they need it and how connected products can improve their lives, those are the kind of things that will drive the business."

BrandSource

AVB/BrandSource also sees opportunities in the connected home, as well as the premium 4K and emerging 8K TV markets with its appliance and electronics expertise. Jim Ristow, CEO of AVB/BrandSource, remarks, "In ultra large TVs, 70- to 75-inch and larger, the market is growing at an unbelievable pace and it is profitable. Over 90% of them are sold at brick-and-mortar locations or true click-and-brick," with dealers delivering and installing these big boxes. "It's in the wheelhouse of our members."

He adds that many BrandSource members signed up for a special Samsung turnkey solution which enables independents that are re-entering the premium TV categories to bundle them with "simple, elegant audio solutions. I think this whole turnkey solution has been a bigger missing link than anyone thought."

In the smart appliance business, BrandSource members' appliance expertise is "our pedigree and history," but it is new technology. Ristow adds that ProSource, the affiliated specialty electronics and custom integration group headed by CEO and President Dave Workman, is working with their retailers "to help our appliance-centric members on this. What we've learned is there isn't just one silver bullet to get truly engaged in smart appliances. It has to be a multi-pronged approach, just like we discussed with ultra large TVs — a turnkey strategy."

ProSource

Workman said TV inventories go through ProSource's system "in one way or another." In connected home "there are some exceptions," such as do-it-yourself products. But ProSource's premium TVs are "Samsung, Sony and LG and we actually make money on TVs. If you focus on the profitable part of the business, that's why Jim and his team are talking about revenue growth to get [some BrandSource dealers] back into TVs."

Workman notes connected home products are, "a little different" for BrandSource dealers versus ProSource members. "For BrandSource you have to

Hakule/Getty Images

Tom Hickman, Dave Workman, Jerry Satoren and Jim Risstow

> **What we've learned is there isn't just one silver bullet to get truly engaged in smart appliances. It has to be a multi-pronged approach — a turnkey strategy.**
>
> - Jim Ristow, CEO of AVB/BrandSource

come up with more of a turnkey solution" when installing smart appliances that are attached to the internet. That is in comparison to a typical ProSource member because its members do "more full-service installations."

Everyone will be watching how 5G develops this year, but question marks are still there for these groups. Hickman says 5G, "could be a game-changer" and is hopeful it can drive the connected home, but is unsure. Workman notes that in the short term for 2020, the question is, "will 5G produce any benefits for our type of dealers that we can monetize," since his group and others do not rely on video games or smartphones for growth.

NATM Buying Group

Jerry Satoren, executive director of the NATM Buying Group, says that 5G "will change our lives and the process starts now," but wonders what will happen in 2020. As far as the connected home category NATM, an organization of a dozen of the nation's largest local independent electronics and appliance retailers, members have done well with Google- and Nest-related do-it-yourself items.

For more extensive and upscale installations, "Our members have tried smart home displays in packaged settings" with some members "making the investment to drive that business," Satoren says. "What's gratifying is that members share expertise on this and other new technologies to come up with best practices."

These executives and their members will be active at CES not only to see new technology first-hand, but to network with existing vendors, and possibly new ones. Satoren of NATM says, "Our entire membership attends. In addition we have a meeting before the show opens with each of our top five vendors." Separately dealers see new vendors at the show, "and for those buyers that haven't seen the new TV models in Asia in October, CES is the first chance to see them."

Workman of ProSource, whose group also goes to Asia in the fall, CES is not only significant because it is a follow-up to that trip, but also because, "We are starting a new calendar year of programs and finishing the holiday season." Just as important, "While we see fewer vendors at CES, our meetings are far more in depth and useful."

Hickman of Nationwide says the group's strategy at CES is to, "See 'what's next.' And we go 30/30/30. We meet with current vendors to see how we can better partner with them; look for new opportunities; and catch up with our members." What's the other 10%? It's a familiar refrain for any longtime CES attendee, no matter how organized: "Chaos and recovery." ■

Steve Smith was the former editor-in-chief of TWICE.

i Business

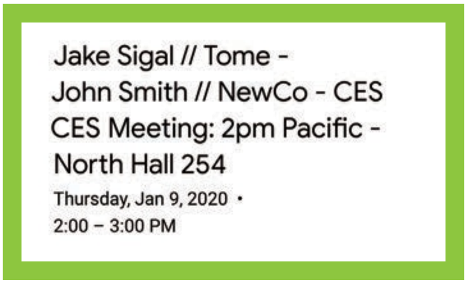
By Jake Sigal

ADVICE FOR ENTREPRENEURS

CES Tips: Calendar Strategies to Make Meetings Happen

Having a great meeting invite means your meeting actually happens. This is obviously important at CES, where everyone is in town to do business face-to-face on a rapid-fire schedule that's fast and furious.

There's a formula I use in the calendar invite that gives everyone the information at a glance. But at busy shows, it's even more critical. Here's a breakdown of why each piece of info is important:



Jake Sigal // Tome - John Smith // NewCo - CES CES Meeting: 2pm Pacific - North Hall 254

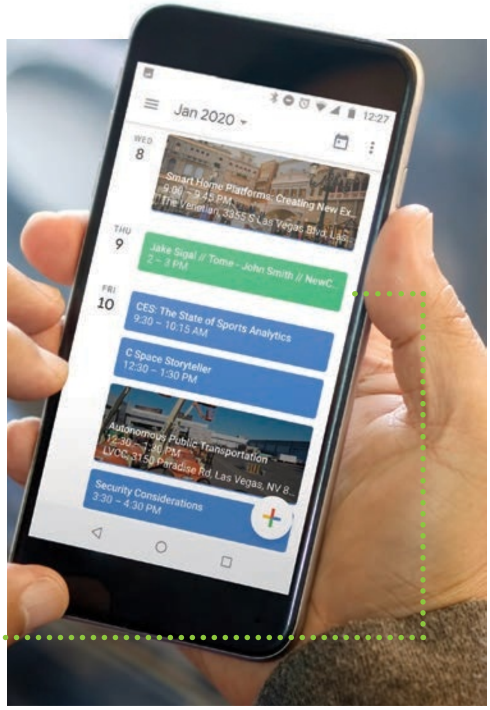
Thursday, Jan 9, 2020 •
2:00 – 3:00 PM

● **My name/name of my company:** By starting here, the other party knows what's up when they see the invite or when the first few characters pop up on an Apple Watch.

● **Their name/their company:** Most people can't remember everyone they meet at CES especially when you have 25 meetings booked. If you're traveling with a colleague, this also lets them see who you're meeting with and not need to ask if you can move things around based on the meeting, saving time.

● **Time zone:** Booking meetings at CES in the right time zone is still a HUGE issue. Putting in the time zone as well as the time really helps. However, when a meeting moves, you need to update the title as well, which adds a step.

● **Location:** This pins down the specific meeting point and makes it easier for others to quickly figure out where you are.


Jan 2020
12:27
WED 8
Smart Home Platforms: Creating New Ex...
9:00 – 9:45 PM
The Venetian, 3355 S Las Vegas Blvd, Las...
THU 9
Jake Sigal // Tome - John Smith // NewC...
2 – 3 PM
FRI 10
CES: The State of Sports Analytics
9:30 – 10:15 AM
C Space Storyteller
12:30 – 1:30 PM
Autonomous Public Transportation
12:30 – 1:30 PM
LVCC, 3150 Paradise Rd, Las Vegas, NV 8...
Security Considerations
3:30 – 4:30 PM

Descriptions Matter

Writing a description for a calendar event, especially for a new lead, helps to keep that meeting from getting bumped. When it's hectic, it's too easy to push out "intro meetings" that don't have a specific agenda.

I include my phone number in the description and a blurb about the best way to reach me, whether that's a call, a voice message or a text. I also add the other person's mobile number. This makes it much easier to reach out on the fly from the calendar notification if plans change or to track someone down in a booth. A quick text to say "OMW" helps save precious minutes at CES.

I recommend adding a quick agenda. For example: "Introduction meeting to Tome Software (Detroit) to review Bicycle-to-Vehicle safety standards." To be honest, this also helps to make sure your meeting won't get cancelled and ensures a successful show. ■

OTHER BEST PRACTICES

Using your calendar to manage meetings with other parties trying to manage their own meetings at CES isn't a perfect science. Here are a few ideas to help keep your schedule orderly amid the chaos.

● Review your calendar at the end of the day to make sure people have accepted your invitations.

● Have a fall back plan. Set a spot to meet if an original meeting doesn't happen.

● Put large multi-hour blocks in your calendar to show where you are at CES. This is also useful to ensure transit time when booking meetings in a CES suite.

● For dinner reservations, include how many seats you reserved. It's a rookie move trying to figure out if you have room for two more people or forgetting where you booked dinner.

● Check the CES map the night before to find booths. In the CES mobile app there's an option to add booths as a favorite so they are easy to pull up when lost.

CES 2020 Download the CES app at **CES.tech/app**

BongkarnThanyakij/Getty Images

TECH TACTICS

NEXT GEN TV: The Transformation Begins

Television has gone through a few fundamental changes, such as the evolution from black-and-white to color in the 1960s, and the transition from analog to digital in 2009. The shift to NEXT GEN TV will change how we watch TV.

NEXT GEN TV is the industry name for ATSC 3.0, the world's first standard for IP-centric, Ultra HD-ready TV. NEXT GEN TV will transform television as we know it. You'll be able to get television on any device — your smartphone, laptop, tablet or TV.

You'll have the ability to access it anywhere: your living room, at a coffee shop, in your car, on a train (at 124 miles per hour) and in the stadium watching the game and replays on your smartphone. You'll also be able to get it anytime, since NEXT GEN TV enables on-demand services for internet-connected devices. So, traditional TV will have the flexibility we now expect from streaming services. You'll be able to pause, resume, rewind and fast forward TV.

Delivered Any Way

With NEXT GEN TV you'll get more programming choices than ever.

It's surprising, but antenna use in the U.S. has grown over the past nine years, from 20% in 2009 up to 31% in 2018 according to CTA market research. NEXT GEN TV will be launched by broadcasters, then delivered by cable, satellite or over the internet.

Exceptional Quality, Personalization and Interactivity

You'll be able to get 4K Ultra HD, in exceptional picture quality, with High Dynamic Range (HDR) — over the air. And it will come with enhanced surround sound.

You'll watch TV in different languages with new features, like increasing the volume of dialogue relative to the background noise. Eventually, you could order the sunglasses that Lady Gaga is wearing as you watch her concert.

It also will be hyper personalized. So, if you live in California it will update you on the wildfires if they are near your house.

It's a Platform Play

NEXT GEN TV is really a platform play, because it will allow third party developers to build apps on top of traditional programming. We can't anticipate all the new features that NEXT GEN TV will bring. It's like a Swiss Army knife of capabilities for television and has been designed for flexibility. NEXT GEN TVs also will allow for software and firmware upgrades for future capabilities that aren't currently imagined.

CES 2020 Debut

We'll see the first NEXT GEN TV sets at CES 2020. Manufacturers are expected to show the first sets which will become available later in 2020. Broadcasters will launch NEXT GEN TV in 61 markets covering 74% of U.S. households.

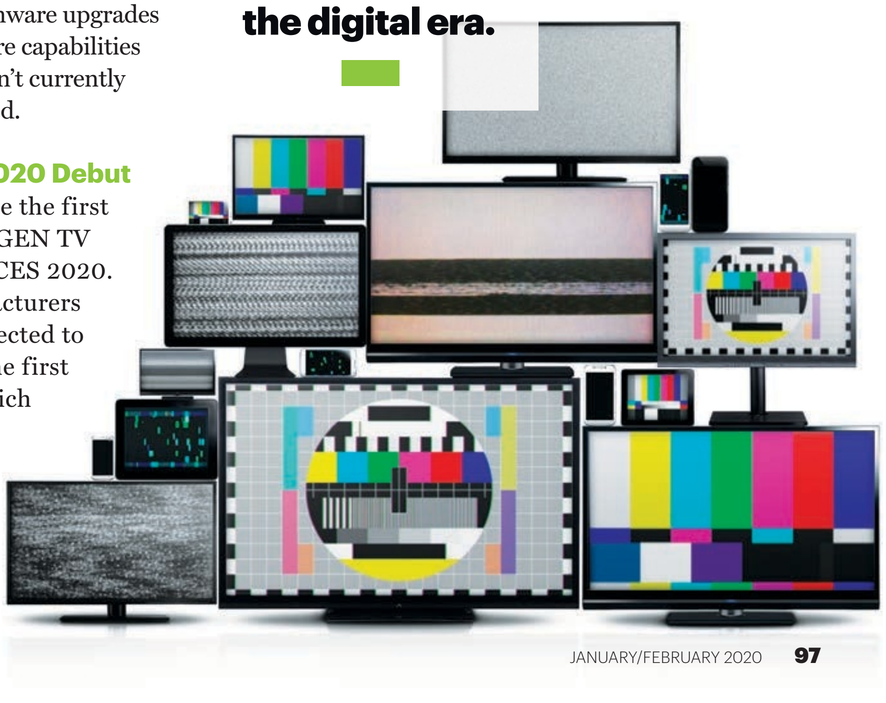
This is enabled by a new standard called ATSC 3.0. The standard is in fact 21 different standards that fill more than 2,000 pages. "It's been seven years in the making," notes John Taylor, senior vice president of LG Electronics USA who's been intimately involved in the standard from the start. It's been an industry-wide effort involving TV manufacturers, broadcasters, the National Association of Broadcasters (NAB) and CTA.

The convergence of broadcast and broadband is really 5G for television. It's the most important upgrade of TV infrastructure in the digital era and is based on internet protocol (IP).

NEXT GEN TV will enable TV on-demand, with real-time interactivity and complete user control through merged broadband and over the air services. NEXT GEN TV also will offer more streaming, choice, channels, flexibility and services. ■

Jim Harris is the author of Blindsided.

The convergence of broadcast and broadband is really 5G for television. It's the most important upgrade of TV infrastructure in the digital era.



Maor Winetrob/Getty Images

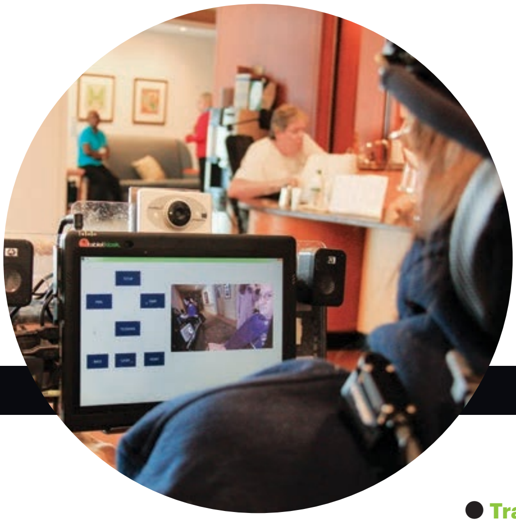
CT REPORTS

Tech Improving Lives at CES 2020

At CES you won't need 20/20 vision to see all the technologies improving lives for people of all ages and abilities. Visit CTAFoundation.tech to see the latest activities we have scheduled for CES and get involved.

CTA Foundation Eureka Park Accessibility Award Winners

In our fifth CES Eureka Park Accessibility Contest, we selected five companies to receive booths in Eureka Park based on their technologies to improve the lives of older adults and people with disabilities. The competition was fierce and we ended up with five diverse types of tech addressing a variety of needs.



OUR WINNERS ARE:

Access Explorer: Their app, Cavu, is for both iOS and Android devices to provide turn-by-turn navigation in indoor environments for people with disabilities and older adults with age-related disabilities. Cavu aims to alleviate the common accessibility gaps present in indoor navigation. These include the need for better accuracy to reach the desired location, the ability to read information signs and a universally available solution.

Intuition Robotics: The company's first product, ElliQ, is a proactive social robot for older adults aimed at keeping users active and engaged by connecting them to their families and the outside world. ElliQ changes the paradigm around technology by celebrating aging and providing aging adults with the independence they desire through powerful motivation techniques and proactive suggestions to stay active and engaged.

Have a great night!
Good morning.
I'm coming over for a walk today at noon. See you in a bit.

Loro: Loro is an intuitive and inclusive robotics startup that is developing a smart assistive companion for wheelchair users. It empowers its users with increased independence and connectedness by enhancing their vision, communication and safety. Loro was founded in 2018 by a diverse team of engineers, designers and entrepreneurs, allowing for the creation of a holistic and user experience-focused product. All team members share the same mission to give people with physical challenges the ability to communicate, control and connect with the world and loved ones.

TranslateLive: The Instant Language Assistant (ILA) device allows older adults and those with disabilities to be able to instantly communicate with anyone they meet, in person or at a distance. It can help those who are deaf, hard of hearing, low vision, blind, deafblind, speech-disabled and is accessible for those with mobility disabilities. Just speak or type to the ILA and it allows you to have a natural conversation that is not only transcribed in real-time but can also be translated in over 120 languages and dialects. The conversation instantly shows to both parties and can be read or spoken aloud by the ILA.

Select your language

● **Mieron:** Mieron's first product, MieronGO, is a library of virtual reality neurotherapy exercises based on the principles of locomotive training, physical therapy and occupational therapy for all levels of mobility. VR is clinically proven to reduce the brain's pain perception by up to 90%, with the effect lasting outside of the VR experience. For older adults with chronic pain and people with neuropathic pain, this pain management system helps reduce dependence on opioids. The MieronGO library has experiences for upper body mobility, core stability, lower body mobility, balance training, gait training, mental wellness and pain management. By working to improve people's mobility by using the Mieron library, users can increase their strength, endurance and physical output, resulting in improved circulation, improving bone density, reducing the risk of secondary injury and improving overall mobility and independence.

CES 2020 Visit each of these winners in Eureka Park along with all the other new innovations from around the world.

The CTA Foundation's Board of Trustees at their fall retreat.

Helping Seed Positive Aging

During the CTA Foundation's fall Board of Trustees retreat, the Board had the opportunity to visit the Front Porch Sunnyvale Community and hear from Davis Park, director of Front Porch Center for Innovation and Wellbeing. He explained that their work — which has included pilots on hearable technologies, voice assistants and smart home technologies — is "only possible because of CTA Foundation funding seeding the experience in our community. CTA Foundation support delivers an impact on the members of the community far greater than the grant dollars provided." ■

JOIN US

Join us at CES 2020. For the latest information, and to join the industry leaders making our work possible, visit www.CTAFoundation.tech.

To be listed amongst the philanthropic leaders enabling people of all ages and abilities to live work and play independently, visit SupportCTAF.org and make a donation.

When you support the CTA Foundation you:

- Will be recognized by the CTA Foundation at CES and other events throughout the year.
- Will be highlighted on the CTA Foundation website and in their materials.
- Receive opportunities to engage in discussions about these technologies at CES and other events.
- Receive opportunities to engage in special research or service projects.
- Gain access to subject matter experts on the staff and in the CTA Foundation network.
- Most of all, you will ensure your resources go to making a true difference to communities in need.

FOLLOW us on Twitter @CTAFoundation, Facebook and LinkedIn.

CTA 2020 Events

CES Unveiled Las Vegas
January 5
Las Vegas, NV

CES 2020
January 7-10
Las Vegas, NV

Winter Break
March 5-8
Snowmass, CO

CES on the Hill
April
Washington, DC

Digital Patriots Dinner
April
Washington, DC

Technology & Standards Spring Forum
May 11-15
San Francisco, CA

CES Asia
June 10-12
Shanghai, China

CEO Summit
June 22-25
Stockholm, Sweden

CES 2021
January 6-9
Las Vegas, NV

CONTACT: For more information, visit CTA.tech/events.

CT REPORTS

BenjiLock's Robbie Cabral: A CES Success Story

Robbie Cabral, CEO of BenjiLock, recently added *Time Magazine's* "Best Inventions 2019" to his impressive list of awards. Robbie launched his product — a fingerprint-controlled padlock — at CES 2017, where it was named an Innovation Award Honoree.

benjilock®
The key is at your fingertips™

Robbie Cabral demos BenjiLock on *Shark Tank.*

Raised in the Dominican Republic by a single working mom, Robbie developed resourcefulness early. "I kind of grew up on my own, and that forced me to figure things out," he explains. In high school he formed a band with friends, which after college would lead them to Los Angeles. Musical success proved elusive, so Robbie enrolled in an international student program at UCLA Extension, where he met his wife.

Robbie spent his 20s building his American dream. He took any jobs: "housekeeper, waiter, valet — I was a working machine," he says. His tireless effort enabled him to start a family, buy a home and reach what he believed was the pinnacle of the American Dream — landing a corporate job. In a devastating setback before Christmas and hours before his wife delivered their third child, Robbie was laid off.

His health suffered as the financial stress compounded. Fifty pounds heavier and clinically depressed, Robbie felt hopeless. He and his wife kept their young family afloat on her teacher's salary while he managed the household. After months of "grinding it out, "I said to myself, 'I've got to do better.'" He joined a gym and it was in the locker room where he recognized a need for a more convenient padlock and thought up the idea for a fingerprint-operated design.

With little cash and no savings, pursuing his dream was difficult. He relied on friends and family — and credit card debt — while he created prototypes and acquired patents.

Robbie identified CES' Eureka Park as the ideal venue to announce his product. He joined CTA as a startup member and purchased a booth for CES 2017. "I wondered how I'd compete with robotics and advanced technology," he recalls. At CES, media and buyers flooded him with interest in the product, and BenjiLock was named a CES Innovations Honoree. Encouraged, Robbie summoned the courage to pitch his product at a casting call for ABC's *Shark Tank*, which holds open auditions at Eureka Park.

Robbie spent the next months cultivating relationships and following up leads from CES and learning about licensing and partnerships. He tapped CTA's Mentor Program for guidance. A few months after CES, ABC producers invited Robbie back for a second audition to pitch Benjilock to "the Sharks." Impressed with his product and moved by his story, the Sharks swarmed Robbie with offers. "Through this whole journey a lot of people doubted me," he says. "To go on *Shark Tank* and hear that first offer and see four of the Sharks saying 'Yes,' I started crying. Somebody actually believes in what I'm doing."

Robbie credits the relationships he built at CES for his success. "The beauty of Eureka Park is you can connect with so many people — startups, influencers, investors and retailers," he says. He still works out of his home on new applications for his hybrid fingerprint technology. "I have my own personal debt but now I have some partners behind me and I'm ready to put the pedal to the metal," he says. ■

> **"The beauty of Eureka Park is you can connect with so many people — startups, influencers, investors and retailers."**
>
> –Robbie Cabral

Courtesy of BenjiLock

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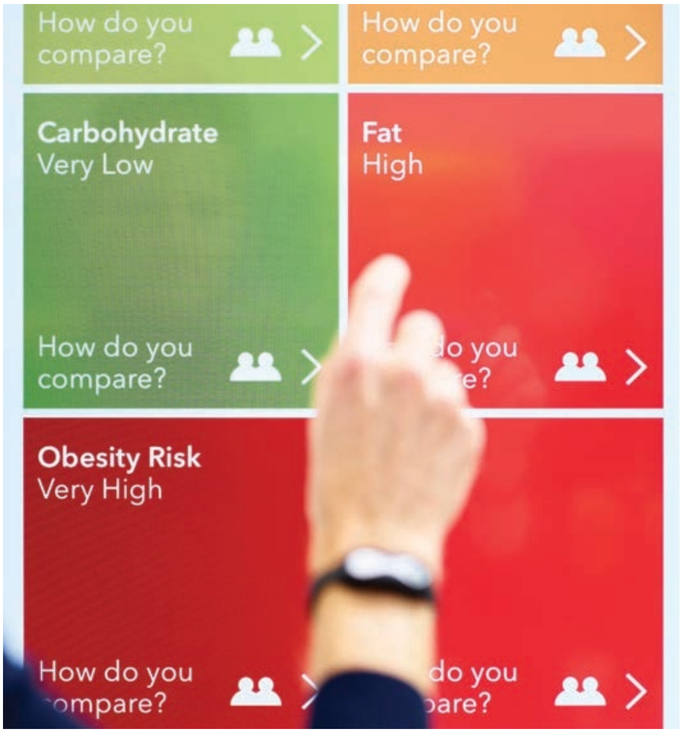
DnaNudge is the world's first in-store genetic service that "nudges" you to make healthier food shopping choices based on your unique DNA, plus your lifestyle. Developed by world-renowned biomedical engineer Regius Professor Chris Toumazou from Imperial College London and published geneticist Dr Maria Karvela, DnaNudge is an entirely new way of thinking about what we're eating and how much we're moving, making a big impact through everyday small changes.



But genetics is just one side of the story. Your inactivity levels (sedentary or sitting time), play a crucial role in determining your overall health. That's why we've incorporated physical inactivity monitoring into our DnaBand – mapped to your personal 'Green DnaBar'. If you've been sitting for too long, your Green DnaBar will turn amber – meaning that your healthier green products will now scan amber and be slightly less healthy for you, until you get up and start moving a little. Amber will then go back to green.

Our message is simple: **eat right, move more.** Through this powerful combination of genetics plus lifestyle, all of us can transform our shopping behaviour and long-term health, one nudge at a time. That's DnaNudge.

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The starting point is a breakthrough on-the-spot genetic test – available at our flagship store in London's Covent Garden, which provides an insight into your risk of developing key nutrition-related health conditions. With the results of this test, you can start using your wrist-worn DnaBand to scan product barcodes in supermarkets, and discover whether a food product is "red" or "green" for your own biology. If the product is indicated as "green", you're good to go. If the product is "red", your DnaNudge App will display a range of personalised alternatives generated by our science-led analytics, based on world-class research.

These everyday small swaps – for example, "nudges" to buy a breakfast cereal that contains fewer calories or less sugar – can lead to big, positive changes to health over time. You can tap DnaBands and NudgeMatch with friends to see which DNA traits you have in common and through NudgeShare, select products that are healthiest for the whole family.

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By Steve Koenig

MARKET BEAT

Technology Product Lifecycles – Understanding Consumer Expectations

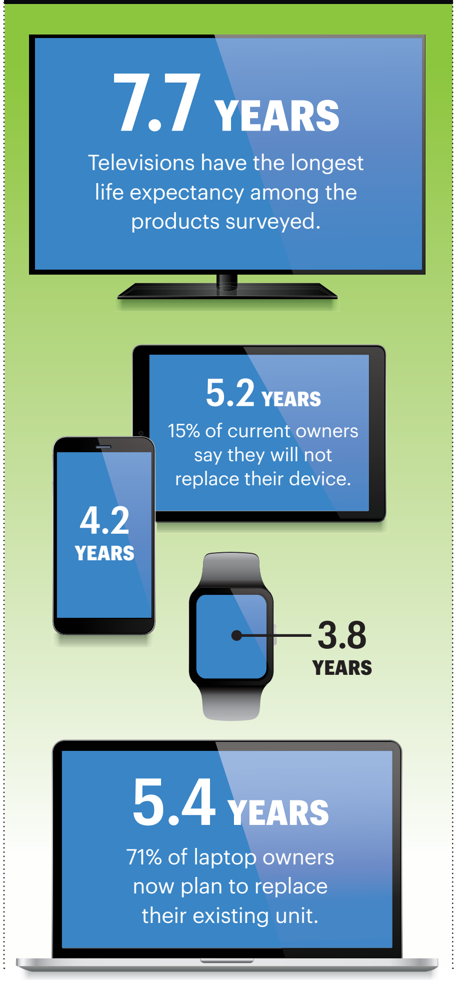
Five and a half years is the average life expectancy for most consumer technology products and devices, consumers say. However, consumer expectations for how long a technology product should last vary widely by device and are influenced by several factors including the technology itself, market dynamics and consumer use. But beyond failure for any reason, the lifetime of a technology product is really at the whim of the consumer.

So how long should a technology product or device last before it stops working or consumers decide to stop using it? CTA examined the answer to this question across 30 different technology products and accessories in its recently published *2019 Product Lifecycle* consumer research study.

To begin with, we asked consumers why they would stop using a tech product — and their reasons are many. Overwhelmingly, the most common reason is because the product stopped working or began malfunctioning. Among emerging technologies, availability of a new or updated version also influences decisions to stop using a given device. This is also true among mobile devices like smartphones and smartwatches.

And in the case of some emerging technologies, consumers may simply no longer want the product. This can stem from a shift in consumer behavior or a change in technology where a standalone product (e.g., media streaming device) becomes a feature of another product (e.g., smart TV). Digital cameras are another example of this dynamic, but also where we see higher intentions not to replace the product at all, suggesting notions of obsolescence.

PRODUCT LIFE EXPECTANCY


7.7 YEARS
Televisions have the longest life expectancy among the products surveyed.
5.2 YEARS
15% of current owners say they will not replace their device.
4.2 YEARS
3.8 YEARS
5.4 YEARS
71% of laptop owners now plan to replace their existing unit.

What's more, considering how technology has become part of personal fashion and home decor, it's understandable a change in style can also influence a consumer to stop using a tech product. This is especially true among wearable tech and smart home devices.

How Long is a Lifecycle?

Just as reasons vary for why a consumer would stop using a technology product, life expectancies also vary. The analysis bears out a key theme, however. The more mature and expensive a technology product is, the longer consumers expect the device to last. Televisions have the longest life expectancy among the products surveyed, followed closely by AV receivers.

In addition to longer life expectancy, mature technology products also tend to exhibit high replacement rates. For example, 71% of laptop owners now plan to replace their existing unit with either a newer version of the same product or a different product. We also observe the effects of convergence in looking at products like tablets where 15% of current owners say they will not replace their device.

Meanwhile, we see lower life expectancies (below the overall average of 5.5 years) among mobile devices and accessories. Smartwatches, for example, are expected to last 3.8 years, with smartphones only marginally higher at 4.2 years.

Emerging technologies are another arena where useful life expectations fall below the overall average. At the category level, smart home products exhibit the lowest life expectancy at 4.7 years. Within the category, smart displays have the shortest life expectancy at 3.6 years, while smart thermostats have the longest life expectancy at just under six years — which to some may still seem short. For more perspective on product lifecycles, check out the study at **CTA.tech**. ■

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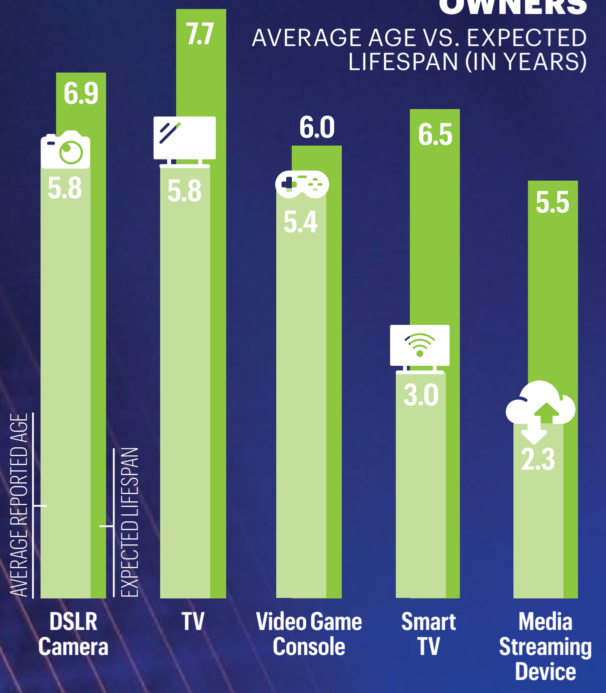
JUST THE STATS

Charting Technology Lifecycles

CTA examined consumer technology product lifespans in its recent *2019 Product Lifecycle* consumer research study. It looked at the lifespan of various products ranging from digital cameras to smartphones, smartwatches and televisions, as well as consumers' motivations for replacing them. To access the study, **visit CTA.tech**.

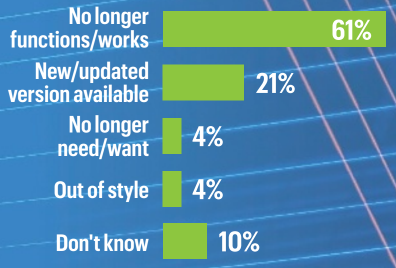
AMONG CURRENT OWNERS

AVERAGE AGE VS. EXPECTED LIFESPAN (IN YEARS)

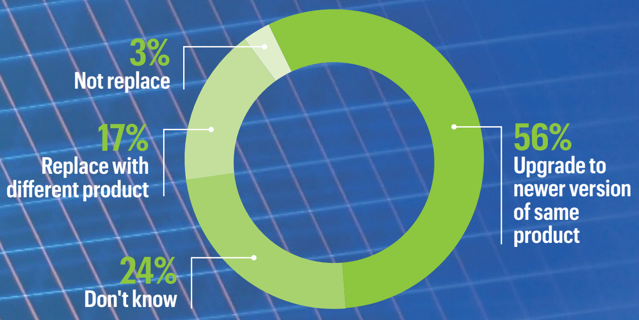


SMARTPHONES

REASONS FOR NO LONGER USING PRODUCT

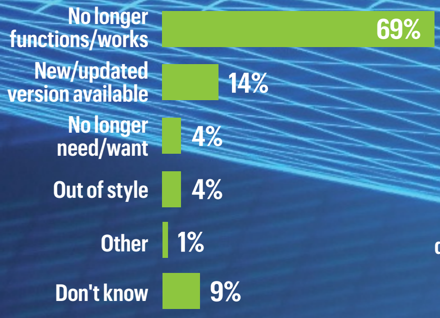


PRODUCT REPLACEMENT PLAN

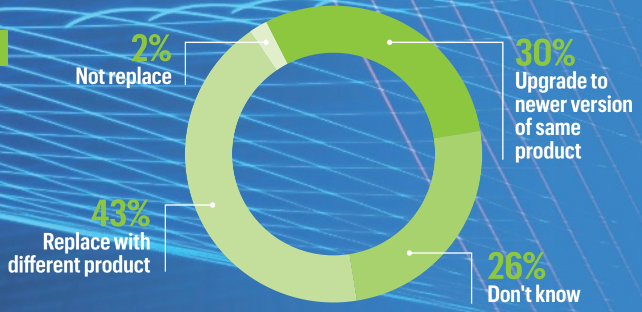


TELEVISIONS

REASONS FOR NO LONGER USING PRODUCT



PRODUCT REPLACEMENT PLAN



Figures may not add to 100 due to rounding.

Source: CTA Market Research

Zhe Yong/EyeEm/Getty Images (Background Image)

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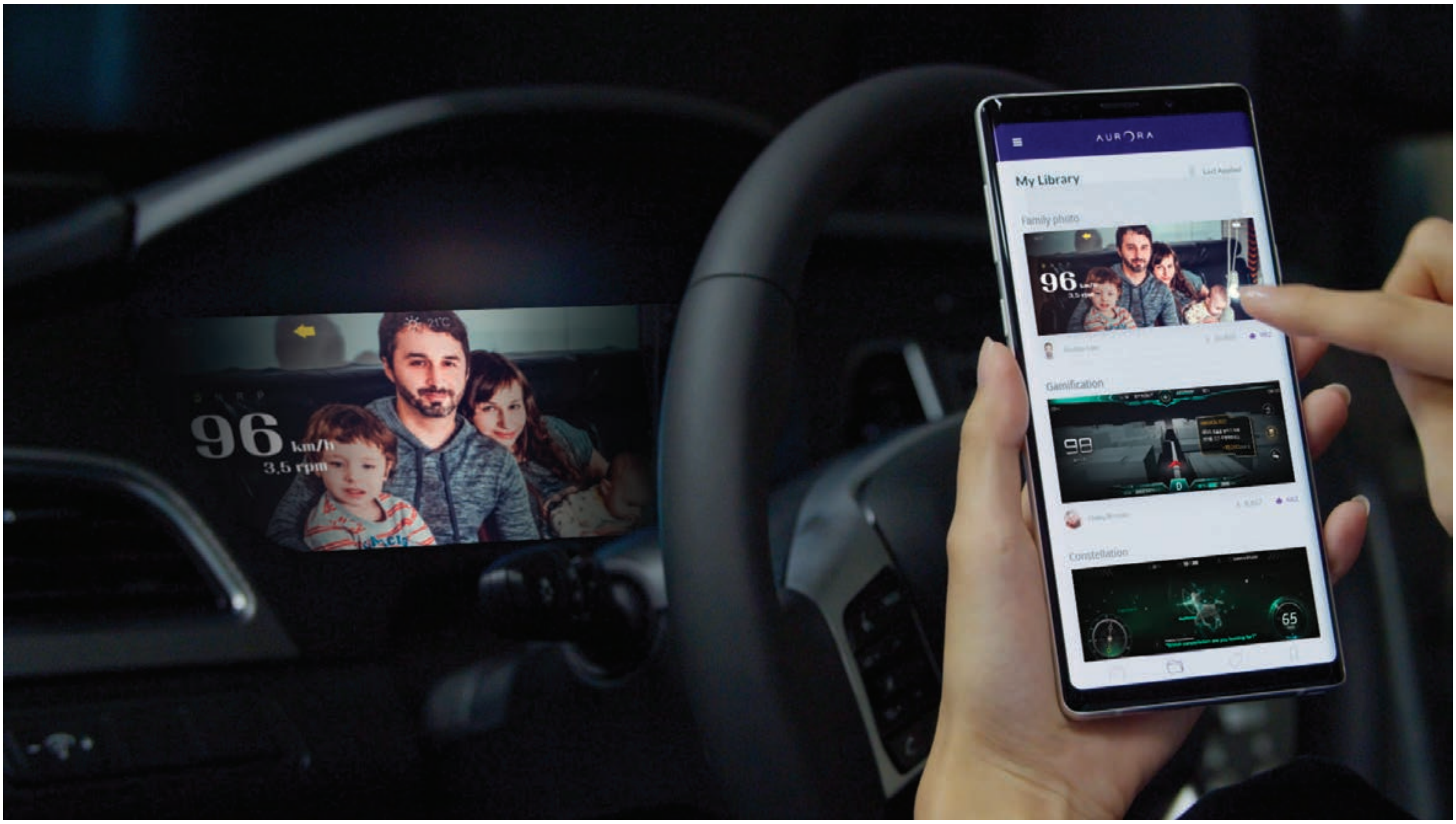
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3.5 rpm
21°C
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96
Gamification
99
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65

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